SCIENCE AND INDUSTRY

	Route to	See page
1		
2		
3		
4		
5		
6		

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1920—Thirty Years of Service to Construction—1950

Contractors and Engineers Monthly

Vol. 47, No. 12 DECEMBER, 1950

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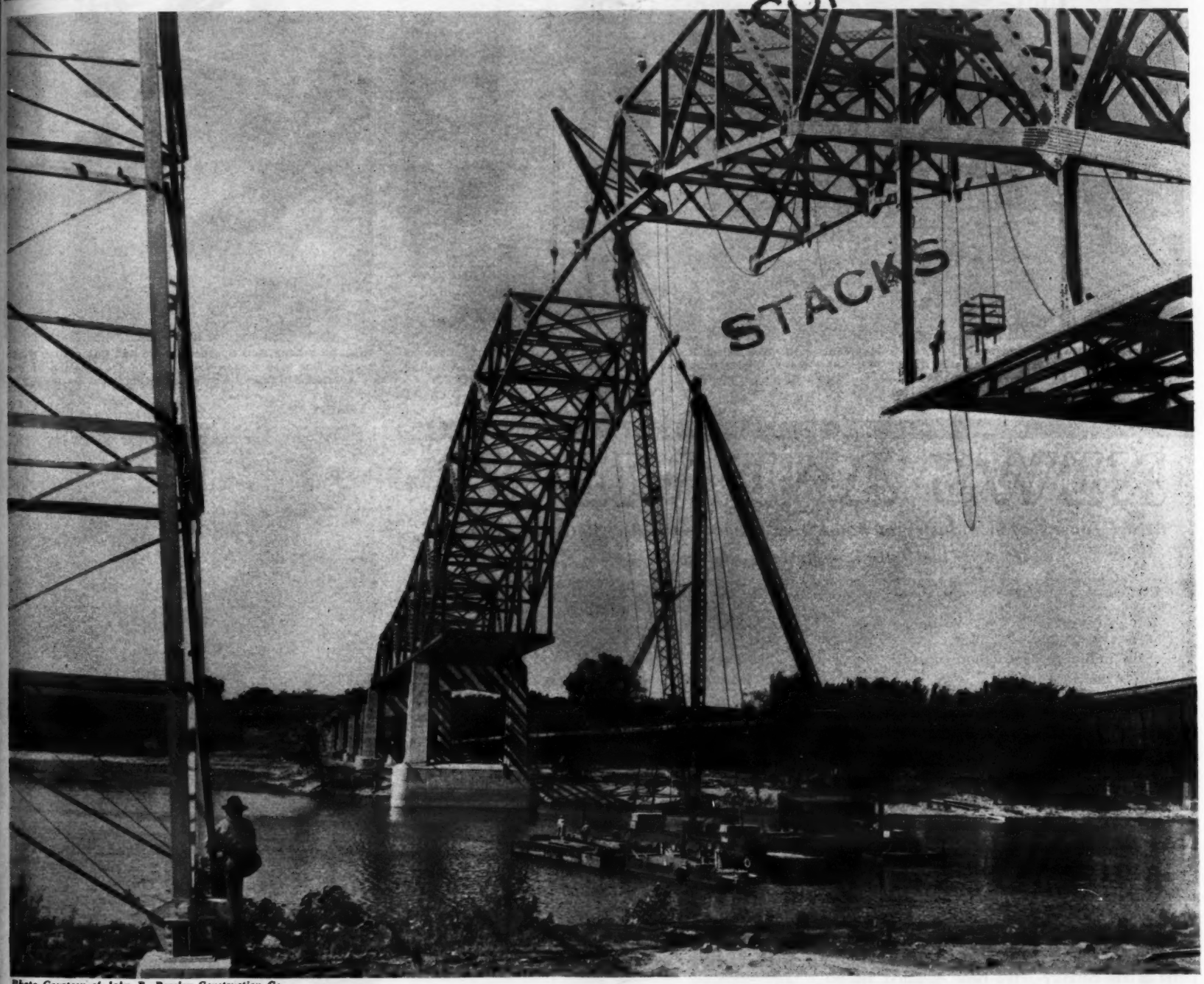


Photo Courtesy of John F. Beasley Construction Co.

Contractor John F. Beasley erected steel on the Hastings Mississippi River bridge in Minnesota from a floating derrick. Wind made erection from above impossible. See page 48.

● Waterworks Expanded

Wellpoints were needed to check ground water on almost all of a 13-mile pipe-laying job—one of seven contracts in the expansion. See page 5.

● County Copes With Dust

A county organization battles an acute dust problem, plus a rapid growth of subdivision streets, with science and field know-how. Page 12 gives details.

● Hospital, Terminal

There are 467 bell-bottom piles, also spread footings, in the foundation for the new 750-bed hospital at Shreveport, La. The job story is on page 18.

The first unit of a five-finger type of terminal building at O'Hare Field, Chicago, will be completed this year. Page 64 describes its construction.

Covering the Field

● New Jersey Turnpike

Articles and pictures on pages 20-21 cover typical grading and sand-drain fill stabilization on the Turnpike, plus a word on concrete and hot-mix paving bids.

● Grand Coulee Canal

An earth-fill dam at the equalizing reservoir, a concrete-lined canal section, and elaborate transitions mark the contract covered on page 33.

● Bituminous Paving

N. C. topped between 3,000 and 4,000 miles of secondary roads with bituminous hard-surface paving in 1950 (page 38).

● Harbor Jetty

The article on page 42 features rock production and handling for a 3,400-foot jetty, part of a harbor and recreation-area development at San Diego.

● Mississippi River Bridge

Even during a windy, rainy spring, steel erection went forward fast at Hastings; so did deck pours. The article that matches the picture above is on page 48.

● Sodding Despite Hogs

They're piney-woods rooters and they have no respect for sodded slopes. Page 53 tells about a new sod-cutter, too.

● Tractors Ease Snow Removal

Tractors help plows fight heavy drifts of snow and wind-blown dirt in a dust-bowl district. Turn to page 60.

● Concrete Expressway

Peak production was the by-product of double pavers and double batching hoppers on this job. Page 68.

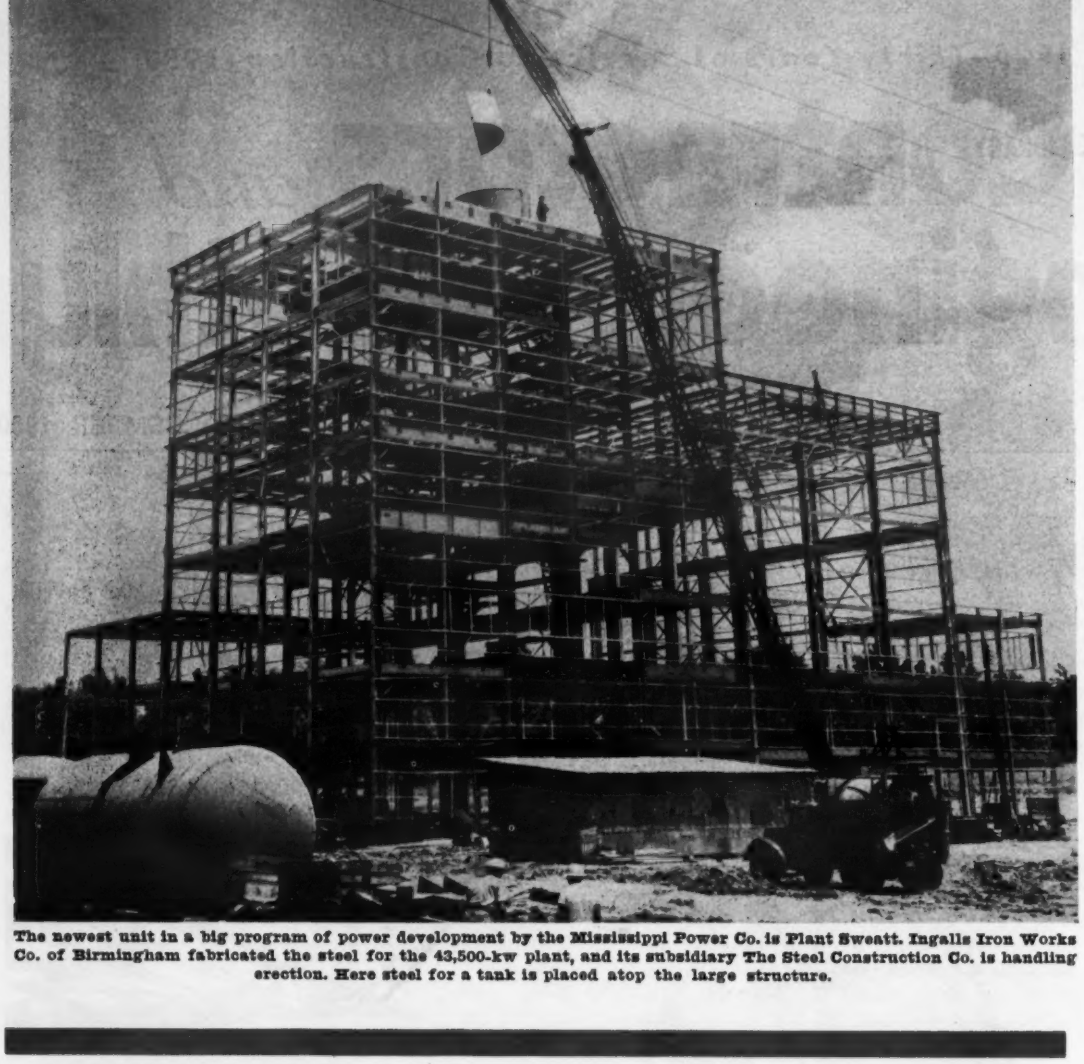
● Safety Congress

Not just safety, but job-integrated safety is the goal. On page 82, some tips gleaned from the Safety Congress.

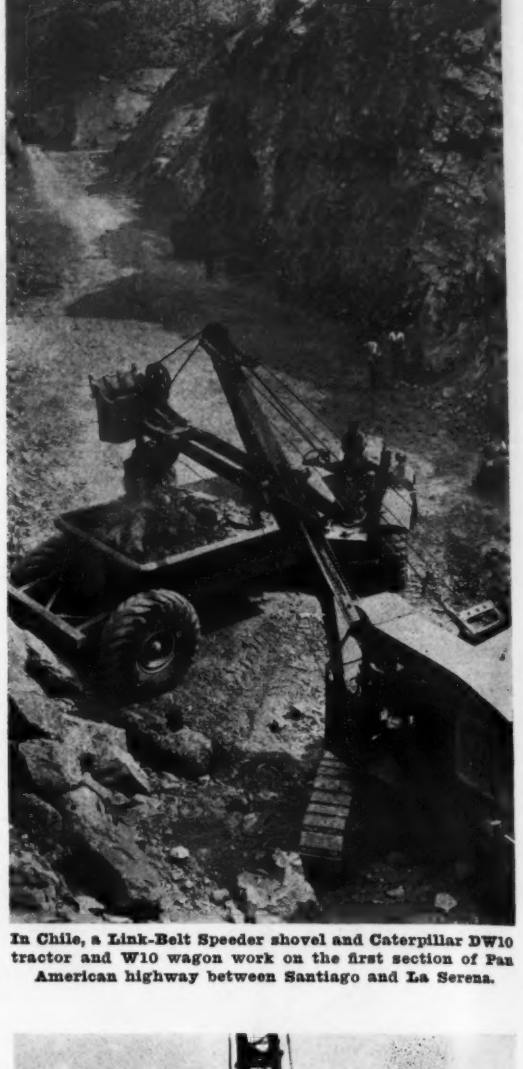
● Dam Gates Installed

Pictures on page 88 trace the installation of three 50-ton penstock intake gates at Bull Shoals Dam.

(You will find "In This Issue" on page 4)



The newest unit in a big program of power development by the Mississippi Power Co. is Plant Sweatt. Ingalls Iron Works Co. of Birmingham fabricated the steel for the 43,500-kw plant, and its subsidiary The Steel Construction Co. is handling erection. Here steel for a tank is placed atop the large structure.



In Chile, a Link-Belt Speeder shovel and Caterpillar DW10 tractor and W10 wagon work on the first section of Pan American highway between Santiago and La Serena.

NEWS AND VIEWS

of the construction industry at home and abroad—trends, State and Federal legislation, materials, and costs

The Army Engineers last month announced 210 of the **military construction projects** they will undertake in 1951, two-thirds of them outside continental United States, principally in Alaska (also Bermuda, Hawaii, and Okinawa). The remaining one-third will be scattered over 24 states and the District of Columbia. Much of the work in the $209 million listing will involve the extension or reconstruction of existing facilities . . . barracks . . . lab and storage buildings . . . runway paving.

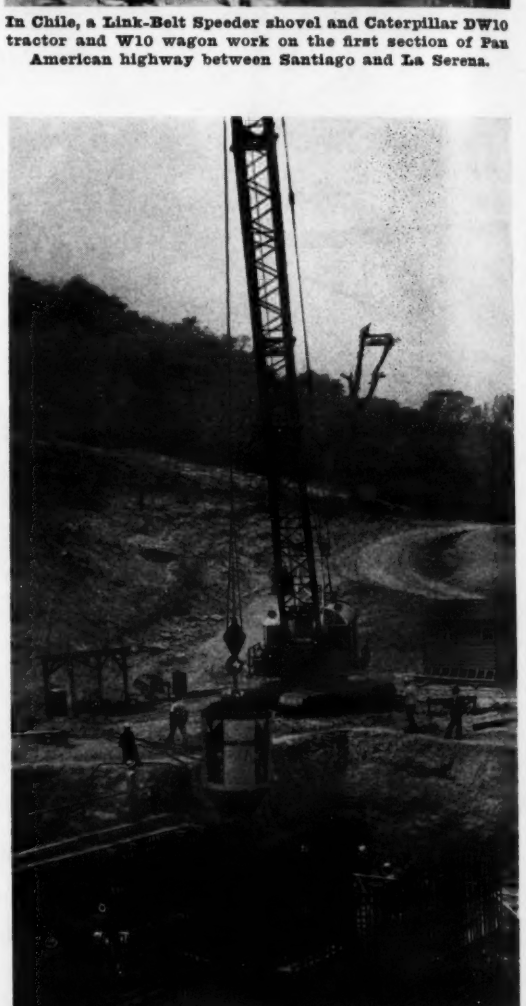
Large engineering and building companies represented by the National Constructors Association report **tighter labor supply and new wage demands** since the Korean war, particularly in the midwest. But though wage increases in many parts of the country have been granted, no national pattern has been established—yet.

Home builders are protesting the Government's Regulation X which curbs credit terms to home buyers. There won't be 800,000 families able to buy homes in 1951 if the regulation stays as written, they say (800,000 to 1,000,000 housing units was the target set by the Government for 1951) . . . And building-materials producers, fearful that they may overshoot or undershoot the market, are crying for definite word from Washington on how far it intends to cut back construction volume.

Toll roads roll on no matter what. Through the summer, Korea and doubt about materials priorities delayed financing arrangements for the 88-mile turnpike from **Oklahoma City to Tulsa,** but $31 million in bond money was delivered last month and first construction contracts will be let this month . . . Ground was broken for the **Denver-Boulder** toll highway in October, after final agreement on details of a $6 million bond issue . . . **Maine** is mulling the extension of the Maine Turnpike to Augusta . . . For word on **New Jersey's** Turnpike see page 20 . . . A north-south toll turnpike has been proposed in **North Carolina,** but surveys indicate that receipts would be only half what is needed to make construction profitable. However, North Carolina is waiting to see what Virginia will do on a similar highway, and Virginia is waiting to see what West Virginia will do.

It is interesting that during the first three quarters of this year, six state legislatures had proposed the issuance of $471 million worth of **highway bond issues**: Michigan, $200 million . . . Massachusetts, $100 million . . . Louisiana, $140 million . . . Rhode Island, $12 million . . . South Carolina, $18 million . . . and New Hampshire, $1 million. In some cases the issues must be approved by voters.

An encouraging word on highway financing comes from, of all things, the Democratic Party of Rhode Island, which adopted the following antidiversion plank in its official platform: "The ever-increasing demand for highways and expressways . . . continues to suggest a readjustment in our tax thinking. We feel that an equitable plan can be evolved to **reinvest on our highways the taxes derived from motor users of those highways."** This in a state which in 1949 led all other states in the percentage of highway revenue diverted to non-highway uses.



Corps of Engineers Photo

First concrete is placed at the Bolton Dam and Reservoir project on the Loon River in Texas. In addition to the outlet works shown here, the contractors have already completed a portion of the 5,520-foot-long earth dam to hold back Loon River waters.

Convention Calendar

January 3-5—Weed-Control Conference
Fifth Annual Meeting, Northeastern Weed Control Conference, Hotel New Yorker, New York, N. Y. Walter C. Jacob, Secretary-Treasurer, Long Island Vegetable Research Farm, Riverhead, N. Y.

January 6—Brazil Road Show
Road Show, Brazil National Highway Department and Associacao Rodoviaria do Brasil, Rio de Janeiro, Brazil. Ing. Jose Maria Carre, Delegado Executivo, Associacao, Rodoviaria do Brasil, Caixa Postal 3451, Rio de Janeiro, Brazil.

January 9-12—Highway Research Board
Annual Meeting, Highway Research Board of the National Research Council, National Academy of Sciences Bldg., Washington, D.C. Roy D. Crum, Director, 2101 Constitution Ave., Washington 25, D. C.

January 10-12—Photogrammetry Meeting
Annual Meeting, American Society of Photogrammetry, Shoreham Hotel, Washington, D. C. American Society of Photogrammetry, Box 18, Benjamin Franklin Station, Washington 4, D. C.

January 28-February 1—AED Meeting
Annual Meeting, Associated Equipment Distributors, Stevens Hotel, Chicago, Ill. P. D. Hermann, Executive Secretary, AED, 360 N. Michigan Ave., Chicago 1, Ill.

February 5-7—Asphalt-Paving Men
Annual Meeting, Association of Asphalt Paving Technologists, Hotel Cosmopolitan, Denver, Colo. Ward K. Parr, Executive Secretary, 1224 E. Engg. Bldg., Ann Arbor, Mich.

February 11-15—National Ready Mixed Concrete Association and National Sand & Gravel Association
Twenty-First Annual Convention, National Ready Mixed Concrete Association, and Thirty-Fifth Annual Convention, National Sand & Gravel Association, The Roosevelt Hotel, New Orleans, La. V. P. Ahearn, Executive Secretary, 1325 E St., N. W., Washington 4, D. C.

February 26-March 1—AGC Meeting
Annual Convention, Associated General Contractors of America, Statler Hotel, Boston, Mass. H. E. Foreman, Managing Director, Munsey Bldg., Washington 4, D. C.

March 5-9—ASTM Meeting
Spring Meeting and Committee Week, American Society for Testing Materials, Netherland Plaza Hotel, Cincinnati, Ohio. C. L. Warwick, Executive Secretary, 1916 Race St., Philadelphia 3, Pa .

March 12-14—ARBA Meeting
Annual Meeting, American Road Builders' Association, Shroeder Hotel, Milwaukee, Wis. Lt. Gen. Eugene Reybold, Executive Vice President, International Bldg., Washington 4, D. C.

March 26-29—Purdue Road School
Thirty-Seventh Annual Purdue Road School, Purdue University, Lafayette, Ind. Prof. Ben H. Petty, School of Civil Engineering, Purdue University, Lafayette, Ind.

March 28-30—N. Y. Highway Engineers
Annual Convention, New York State Association of Highway Engineers, Rochester, N. Y. William H. Saunders, Convention Secretary, P. O. Box 72, Rochester, N. Y.

April 30-May 4—Materials-Handling
National Materials-Handling Exposition and Conference, American Materials Handling Society and Material Handling Institute, International Amphitheatre, Chicago, Ill. Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Highway Research Review

The third issue of the "Highway Research Review" is now available. It contains information on new research projects, a topical listing of the research projects given in the first two issues, and the papers presented at the last annual meeting of the Board. In addition, staff engineers of the HRB have summarized in this issue research activities throughout the United States in the fields of economics, administration, finance, design, materials, construction, maintenance, traffic, and soil technology.

Copies of this issue may be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. The price is 45 cents.

Doing Business With Unions

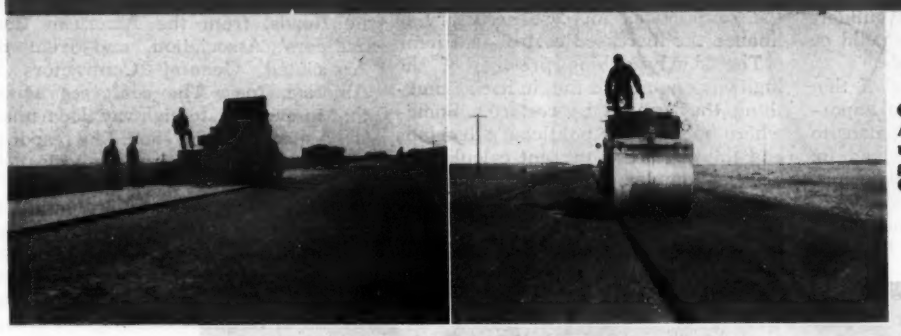
A manual has been written for employers distracted by the difficulty of doing business with unions. It is a practical guide to how to negotiate and write a better union contract. William J. Baade, Jr., Associate Editor of "Employee Relations Bulletin", wrote it, assisted by Morris Stone, and its title is "Management Strategy in Collective Bargaining Negotiations".

Part I seeks to explain why unions act like unions, with emphasis on the psychological factors that affect their policies. Under the heading "Union-Management Relations and the Law", Part II covers unfair practices by employers and by unions, the determination of employee representatives, the free-speech question, and bargaining in good faith. Part III discusses basic union aims and management bargaining strategy; and Part IV, safeguarding management rights. With Part V we move to the bargaining table itself and discuss the conduct there, particularly the employer's. Throughout the book are specimen clauses taken from existing labor agreements, which illustrate present-day trends — together with pointers on how to select the right clause when writing up the contract. An appendix gives the text of the Taft-Hartley Act.

Copies of the book can be secured from the National Foreman's Institute, Inc., New London, Conn., at a cost of $5.00 each.

South Dakota teams ASPHALT with GRAVEL

in 19-mile State Highway project



Constructing 3½-inch Texaco Asphaltic Concrete pavement, using crushed gravel aggregate, on U. S. Route 77, near Clear Lake, S. D.

Completed asphalt-gravel surface on 12-inch stabilized gravel base, constructed by the P. A. Bradbury Construction Company, Aberdeen, S. D.

An interesting feature of this 19-mile project on U.S. Route 77 in South Dakota was the use of gravel aggregate for both foundation and wearing surface. A 130-penetration Texaco Asphalt was plant-mixed with crushed gravel to provide a resilient, durable surface, 3½ inches thick. To lend adequate support to the surface, the State called for a stabilized gravel foundation, having a thickness of 12 inches.

Throughout the country east of the Rockies, Texaco Asphalt products help build good roads economically with aggregates of many types—gravel in South Dakota, caliche in south Texas, sand in North Carolina, trap rock in Massachusetts. Whatever the aggregate available in your own locality, you very likely will find there is a Texaco Asphalt Cement, Cutback Asphalt or Slow-curing Asphaltic Oil, which is ideally suited for use with that aggregate in the construction of good roads at moderate cost. Whether your street or highway needs a heavy-duty pavement, a low-cost surface or a surface-treatment, you can rely on the dependable performance of uniformly high-grade Texaco Asphaltic materials. They are refined from carefully selected crudes. Back of them are 45 years experience in supplying America's ever-growing asphalt requirements.

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TEXACO ASPHALT

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Christmas Present

There was a day when road builders decided where our highways should be built. Remember?

There is now a growing belief that this day is past. Roads are too important to our way of life for politicians to ignore. Quickly they have moved in. They have demanded unrealistic things which, if fulfilled, would produce votes. For example, what would be more persuasive a voting point than a blacktop road to every farm door?

When engineering and economic laws failed to justify these demands, the road builders resisted, at first with some success. Today they defer more and more to the politicians. It is happening at all levels of highway construction from the smallest county through the state highway departments and all the way to Washington, D. C.

Dangerous compromises are being made. Whether we like to admit it or not, engineering prestige in many a high place is slipping, and politics is taking its place. From high up within the AASHO Executive Committee have come pessimistic expressions in this regard.

There's a sound reason for the ebb in prestige. Engineers, like politicians, have to be sensitive to the wishes of the people. They are also human. People can't continually turn down an engineer's recommendations, ignore his conclusions, refuse him funds, and applaud and stamp their feet at every politician with an emotional appeal who criticizes the highway department—without causing some discouragement to the engineer.

It gets down to the point where the engineer, feeling that he has no backing from anybody, says to himself, "The hell with this; it's not worth the worry." One state highway department even talked about the abandonment of maintenance when its people turned down the gasoline-tax increase necessary to finance the increased cost of that item.

The slowly ebbing prestige of the highway engineer is not, in itself, something that cannot be restored. Somewhere between the politician's demands and the engineer's present calculations lies the complex truth of road building which, when it is found, will be best for all the people. Nobody is better equipped to dredge up this truth than the highway engineer. Nobody is working harder at the job than he.

In the interim, something vital is needed in the way of a system of checks and balances to place highways once more in the hands and minds of engineers, and to keep them there until the public will tolerate no other arrangement.

We do not pretend to know what mechanics would enter into this system. We know it will not be easy to devise. We know only that it calls for deep, clear thinking and for a better knowledge of the modern transportation system. It will call for persuasive selling, for cold facts and logic, and for closer liason with the people. It is the biggest problem highway engineers have ever faced.

But it is not unsolvable. The fine minds of men like MacDonald and Purcell and Baldock and White and others of like caliber, backed by long records of achievement, hold the keys to the puzzle. Sometime soon, before these men bow out, we hope the old fire will burn again to devise that system of checks and balances, and put it to use in a way the people will never forget.

If they can do it—and we affirm our belief that they can—Uncle Tom MacDonald and the fine men of road building will have given the somewhat ungrateful people of this nation the most priceless Christmas present they ever received.

The ECPD Needs Your Help

Only in the past quarter of a century have engineers done any serious thinking about their economic and professional status as a group. Before that, they were principally concerned with the mastery of their art. It was while wandering through the economic wasteland of the '30's that engineers began to think of their work, ideals, skills, and lack of professional recognition. It was during this period also that the Engineers' Council for Professional Development was formed as a conference body concerned with the professional welfare of engineers.

It is still a time for thinking—more than that, for acting. One of the basic ECPD concepts is that there are four normal stages in the life of an engineer, and that in each stage the profession as a whole has a responsibility. In the first or pre-college stage, the profession must encourage only those who are fully qualified to embark upon the arduous course of engineering studies. In the undergraduate stage, the profession must share with educators the reponsibility for standards of instruction. In the third stage, when the young engineer enters industry, the profession must create opportunities for personal, economic, and professional growth. And in the fourth stage—full professional practice—the profession must concern itself with standards by which the engineer becomes established and is recognized both by the profession and by the world at large.

If the profession is to recruit the most capable young men, train them in schools and industry, and give them economic and professional satisfactions, more engineers must contribute to the program of the Council: find out what it is, how it is organized, what its program is, and how it can be helped to do its job. The Council needs the cooperation of engineers who are familiar with the goals of the organization and who are willing to assume ECPD responsibilities on the local level.

There's a job to do. The time to do it is now.

National Group of Highway PR Men May Be Formed Soon

A national organization of state highway department public-relations men may be in the making. At least the possibility of such a group was explored last October in a meeting at Baltimore, Md., with Clinton H. Johnson, Public Relations Director of the Maryland State Roads Commission, serving as host.

Those attending included public-relations directors from 10 state highway departments, from the Bureau of Public Roads, from the American Road Builders' Association, and from the Associated General Contractors of America, Inc. The conferees agreed that in every state highway department some special person should be responsible for public-relations activities. A national highway PR organization, if eventually formed, would operate in cooperation with existing PR groups and committees in the highway field, not independently of them. The emphasis would be on exchange of ideas instead of frequent meetings. Perhaps the most useful single function of such a national group would be to set up a digest of case histories on methods and accomplishments in various states so that one department could learn from another.

There were round-table discussions of press, radio, television, and trade magazines during the three-day session, and brief addresses by newspaper and radio editors. Mr. Johnson was named Chairman of the committee which will explore the possibility of creating a national highway public-relations organization.

In This Issue

Airports	64, 74
Bituminous Paving	38
Book Reviews	3, 15
Bridge Construction	48
Building Construction	18, 64
Canal Construction	33
Care of Equipment	17
Concrete Paving	68
Convention Calendar	3
County Road Work	12
Dam Construction	33, 52, 88
Distributor Doings	77
Editorials	4
Grading	20, 21
Harbor Work	42
Highway Maintenance	60
Jetty Construction	42
Legal Decisions	57
Meeting Reports	11, 82
New Jersey Turnpike	20, 21
News and Views	2
Pipe Laying	5
Public Relations	4
Roadside Development	53
Rubber Roads	51
Safety	82
Snow Removal	60
Water Works Construction	5

Vehicle Registrations, Travel, Loads in 1949-50

Auto, truck, and bus registrations will reach 48,484,000 this year, the Bureau of Public Roads estimates—an increase of 8.5 per cent over 1949. Autos show the greatest increase, 9 per cent, reaching a total of 39,710,000. California, New York, Pennsylvania, and Texas lead in total motor-vehicle registrations.

As for motor-vehicle travel in 1949, the 216.3 billion vehicle-miles broke all records. Seventy-four per cent of that travel occurred on the 345,000 miles of main state highways; 26 per cent on the 2,670,000 miles of secondary and local rural roads. Passenger cars accounted for 78 per cent of the travel on main state highways, buses for 1 per cent, and trucks for 21 per cent.

Ton-mileage hauled by trucks increased 7 per cent over 1948 and the average load increased 2 per cent to about 10,250 pounds. Travel by single-unit trucks was 5 per cent higher than in 1948, but travel by truck combinations was 10 per cent higher. Slightly more than 5 per cent of all trucks and combinations exceeded some state legal-weight limit; 16 per cent of the truck-combinations were overweight.

"Don't tell ME how to build a dam!"

Norfolk, Va., Expands Its Waterworks System

Seven Contracts in Improvement Program; 13 Miles of 48-Inch Water Main Is Largest; Ground Water Checked by Wellpoints

✦ FAST-GROWING Norfolk, Va., is expanding and improving its waterworks system under a comprehensive program that will cost around $12,000,000. So far seven contracts are included in the big project; of these, six are already finished. Work on the filtration plant, the last contract awarded, is scheduled for completion in 1952. Contract 2, the most impressive, being the largest both in size and money, involved the laying of over 13 miles of 48-inch reinforced-concrete water main in ground where the high-water table required the use of wellpoints for about 90 per cent of the distance.

Norfolk gets its raw water from two sources, each supplying about half the city. About 4 miles east of the city is the Moore's Bridges purification plant, which receives raw water from Lake Wright, the two Little Creek reservoirs, and North Landing reservoir. This plant delivers water into the easterly side of the city, and also eastwardly as far as Virginia Beach and Fort Story. On the westerly side of the city is the 37th Street purification plant which receives its raw water from Lake Prince, nearly 20 miles west of the city. Both plants deliver directly into the distribution system, which includes large mains running continuously from one plant to the other.

Now the long 48-inch main will bring water from Lake Prince, where there is a safe supply of 42 mgd, to the Moore's Bridges plant, which is being extensively improved and enlarged. At present only half of this line has been laid, and it receives raw water through a cross-connection to one of the two lines now in use from Lake Prince to 37th Street. It is intended to continue the 48-inch line to Lake Prince and construct another pumping station at the dam. Then there will be three supply mains from the lake to the city. In addition, storage tanks have been constructed as part of the new, well balanced water supply system.

Many Contracts

Contract 1 for the fabrication and erection of two 1,000,000-gallon steel elevated tanks was awarded by the City to the Chicago Bridge & Iron Co. of Greenville, Pa., on its low bid of $273,951. Fabrication was completed last year, with the erection getting under way in January, 1950; the tanks were finished by July. They are the radial-cone type, and are 95 feet above the ground measured to the bottom of the water level. High-water level is 120 feet above the ground.

One tank is located in Ocean View, at the north end of the city, while the other is in the old Berkley section close to the city line on the south. These high storage tanks will insure better water pressure to those areas of the city formerly served by the pumping station at Moore's Bridges and a booster unit in Berkley. The tanks were put into service upon completion.

Foundations for the heavy tanks and the weight they hold were constructed last year under Contract 6 held by the Lang Construction Co. of Hampton, Va. This $338,730 contract was divided into two parts of which $126,420 covered the foundations for the two elevated tanks, and $212,310 was for alterations and improvements at the Moore's Bridges plant. Each elevated tank is supported on 12 shafts and a central pier rising from concrete footings that rest on piles having a maximum length of 80 feet. The Raymond Concrete Pile Co. drove the piles, a minimum of 12 to a footing, which consist of steel casings filled with concrete.

More Storage Tanks

Open lake storage of finished water at the Moore's Bridges plant is now superseded by two 6,000,000-gallon filtered-water tanks built by the Van Guard Construction Co. of Norfolk under Contract 5 for $309,410. The welded-steel-plate tanks are 160 feet in diameter x 42 feet high, and have a greater storage capacity than the open lake. They were started in June, 1949, and were completed last January, erection being done by the Gary Steel Co. of Norfolk.

C. & E. M. Photo
At the Eastern Branch of the Elizabeth River, Norfolk's new 48-inch water main is supported on concrete-pile bents. The bridge that carries U. S. 13 over the river is visible in the background.

The foundation consists of a 3-foot bed of gravel laid on a compacted-sand base course encircled by a concrete ring footing. The bed is covered by a ¼-inch steel-plate floor. Thickness of the wall plates ranges from 1 5/16 inch at the bottom to ¼ inch at the top, with 3/16-inch plates making up the roof.

(Continued on next page)

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Finest for flotation, rolling big loads faster

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GOODYEAR

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

C. & E. M. Photo
Chicago Bridge & Iron Co. erected two of these radial-cone elevated tanks to increase water pressure. This one is at Berkley, close to the Norfolk city line on the south.

C. & E. M. Photo
A Bucyrus-Erie scraper pulled by an International TD-18 grades the site for the new filtration plant. In back are the two 6,000,000-gallon filter tanks built by Van Guard Construction Co. to supersede open lake storage at the Moore's Bridges Plant.

C. & E. M. Photo
A 16-foot length of Lock Joint pipe is suspended over the trench as Mundy's Superintendent Bennett signals the operator of the Northwest Model 6 Pull-shovel to lower away.

Norfolk, Va., Expands Its Waterworks System

(Continued from preceding page)

Just for the record, Contract 4 covers the purchase of office equipment and reorganization of the office operation for the Division of Water Supply.

Over and Under Water

The long water main has a total length of 13.8 miles, including a 1,377-foot over-the-water crossing of the Eastern Branch of the Elizabeth River, and a 1,651-foot submerged line under the Southern Branch of that same river. These river portions of the pipeline were completed under Contract 3 which was divided into two sections. Section 3-A, for carrying the pipe over the Eastern Branch, went to the Tidewater Construction Co. of Norfolk on a low bid of $109,377. Work started in June, 1949, and was finished in July, 1950. The Carpenter Construction Co., also of Norfolk, was awarded a $268,914 contract for Section 3-B to build the submerged line under the Southern Branch. This portion of the project got under way in December, 1949, with completion set for late 1950.

C. & E. M. Photo
Workmen get a Moretrench wellpoint riser into the ground beside header pipe. In the background are sections of Lock Joint pipe yet to be laid.

Over the Eastern Branch, 60-foot lengths of steel pipe are carried on two-pile bents 60 feet apart, and paralleling a bridge on U. S. 13, the Military Highway that circles Norfolk on the south and east. The piles are reinforced concrete, 20 inches square x 92½ feet long, connected at the top by a concrete cap on which is a saddle for holding the pipe. At the center of the trestle is a four-pile bent containing an expansion joint.

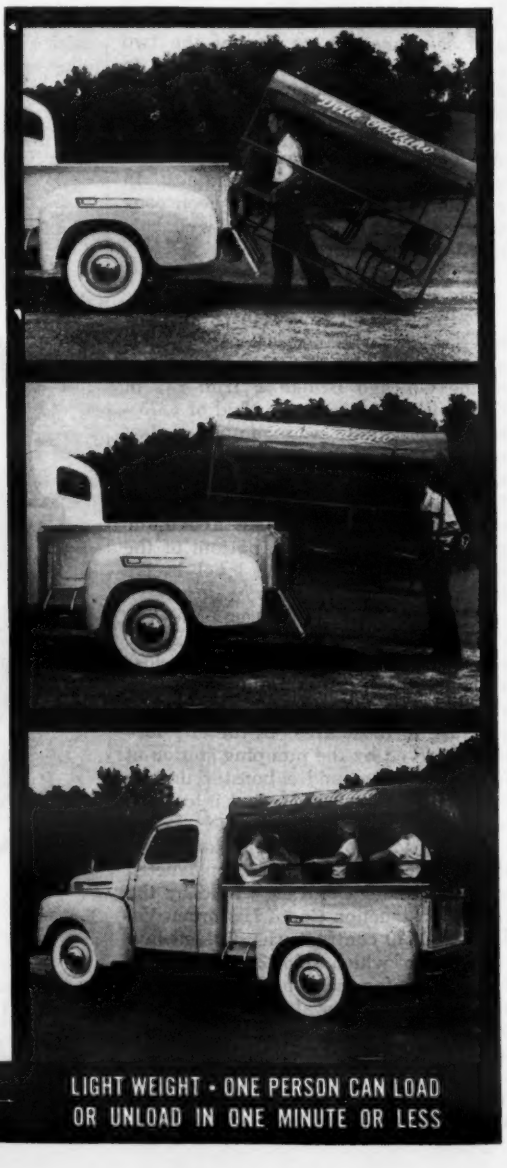
The steel pipe, fabricated by the Richmond Engineering Co. of Richmond, Va., is joined together with welded joints, and is lined with a cement-sand mortar from 3/16 to ¼ inch thick. The lining was done by the Centraline Corp. of New York City,

(Continued on next page)

IT'S SENSATIONAL!

Dixie Tallyho

MAKES LOWEST COST STATION WAGON IN THE WORLD!



Ideal for transporting war plant workers, industrial personnel and farm labor

UTILITOP

Here's the answer to converting an open pick-up truck into a low cost "panel delivery" truck. Fits any ½ ton model. Weatherproof and safe. Protects equipment, provisions, etc., from weather.

Dixie Tallyho fits any half ton pick-up truck snugly. It's rugged and durable. Has heavy canvas sides that zipper close for weather tightness and top reinforced with hardwood slats. Comfortable spring action seats. Sides have plastic windows which won't crack or break.

Ideal for contractors, lumbermen, farmers, mining operators and all industries which need a low cost, safe, comfortable means of transporting labor.

DEALERS WRITE FOR FRANCHISE — YOUR TERRITORY TODAY. DIXIE TALLYHO IS IN GREAT DEMAND EVERYWHERE.

Write today — DIXIE TALLYHO, Inc., Fairburn, Ga. Phone 6411

LIGHT WEIGHT - ONE PERSON CAN LOAD OR UNLOAD IN ONE MINUTE OR LESS

usually at night because of the intense heat during the daylight hours from the sun beating down on the metal pipe. Special equipment was used by the contractor in mixing and placing the mortar within the pipeline.

Because of navigation on the Southern Branch of the Elizabeth, a submerged line was required. This consisted of 12-foot lengths of 42-inch-diameter cast-iron pipe having ball-and-socket joints calked with lead. The pipeline was made up on the right bank with joints connected, and supported on an inclined track. In the meantime a trench was dug across the bottom of the river by the Norfolk Dredging Co. to such a depth that the top of the pipe would be 45 feet below mean low water. Then the pipeline was pulled across the river on a cable hooked from a derrick barge to a deadman on the opposite shore. It was floated by means of eight 55-gallon oil drums per joint until it was exactly over the trench. Then the drums were punctured, permitting the pipeline to sink slowly into position in the riverbed.

Long Pipeline

The rest of the long pipeline, 70,000 feet or slightly more than 13 miles in length, was installed by A. Stanley Mundy & Co. of Woodbridge, N. J., under Contract 2 for $2,158,766. Work started in July, 1949, and was completed one year later. The big 48-inch pressure water main runs from Simonsdale, west of both Norfolk and its neighboring city Portsmouth, following an alignment south and east of the city, until it reaches the plant at Moore's Bridges. At its western end it connects to the existing 36-inch line from Lake Prince. It also forms a continuous main with the river-crossing sections.

All the pipe for this contract was furnished by the Lock Joint Pipe Co. which set up a manufacturing plant at Craddock, Va., only 8 miles from the center of the job, thus assuring a short truck haul in delivering the sections. The pipe was made up in 16-foot lengths weighing 7½ tons each, with their steel cylinders embedded in reinforced concrete accounting for the great weight. The route of the pipe was in open country, following closely alongside the Military Highway for about half its length and through fields and swamps the rest of the way.

In some of the marshy areas the pipe was strapped to timber-pile bents driven into firm ground, but for the most part the sections were laid on a natural sand bottom. The depth at which they were laid varied, the backfill cover ranging from 2½ up to 10 feet. At one location the main goes under 14 tracks in the yards of the Norfolk & Western Railway. Under 11 of these tracks open-cut excavation was possible, but jacking was resorted to under three main-line tracks. A 72-inch pipe was jacked under the embankment for containing the 48-inch water main.

Under some highway crossings the pipe was encased in concrete for added protection. This usually consisted of 6-inch slabs on the bottom and sides, with 1½ feet of concrete on top; in some places the top concrete was continued right up to the surface.

Ground Water High

Over nearly the entire project, ground water was encountered within 3 feet of the surface. This condition required the constant use of a wellpoint system. The Moretrench system used included 1,000 linear feet of 6-inch header line and four Moretrench 8 x 6 pumps. Two separate crews, averaging 12 men each, excavated the trenches and laid the pipe. Equipment for each gang included a Model 6 Northwest 1½-yard Pull-shovel for opening the trench and setting pipe, and an International TD-14 dozer on the backfill. A Northwest 25 crane with a 40-foot boom and a 1-yard clamshell bucket was used in pulling wellpoint risers, and for general clean-up after the backfill.

Generally one 8 x 6 pump was used with about 400 feet of header line. Ordinarily a single line on one side of the trench sufficed to lower the water table, but in some places two lines, one on each side, were required. Risers, 2 inches in diameter x 12 feet long, were spaced on an average of 8-foot centers and jetted into the ground with the help

(*Concluded on next page*)

C. & E. M. Photo

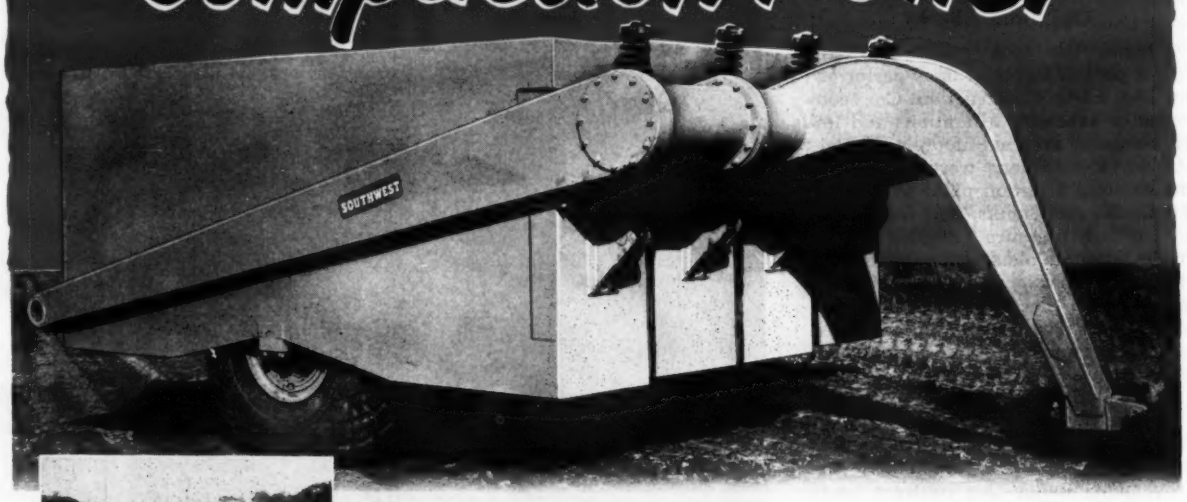
Left to right, M. W. Lucas, Field Engineer for Norfolk; H. C. Conklin, Inspector for the city; and Elmer J. Bennett, Superintendent for A. Stanley Mundy & Co. Behind the men is a Moretrench 8 x 6 pump.

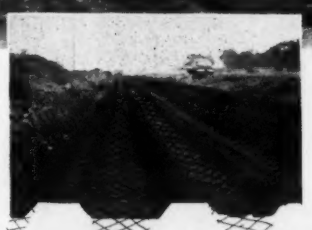
SNOWPLOW OPERATORS

The use of MOLDBOARD GLAZE on snowplows will prevent sticking and will cut thru easier. Low cost per application—dries fast in any temperature. Accept no substitutes.

THE NORGAHN COMPANY
Snowplow Specialties
WAUSAU WISCONSIN

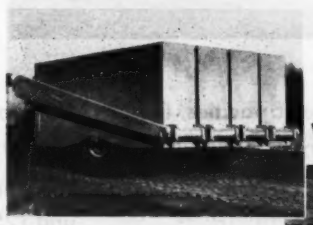
SOUTHWEST
Compaction Roller





Note how every print of each tire tread is uniform in depth and shape.

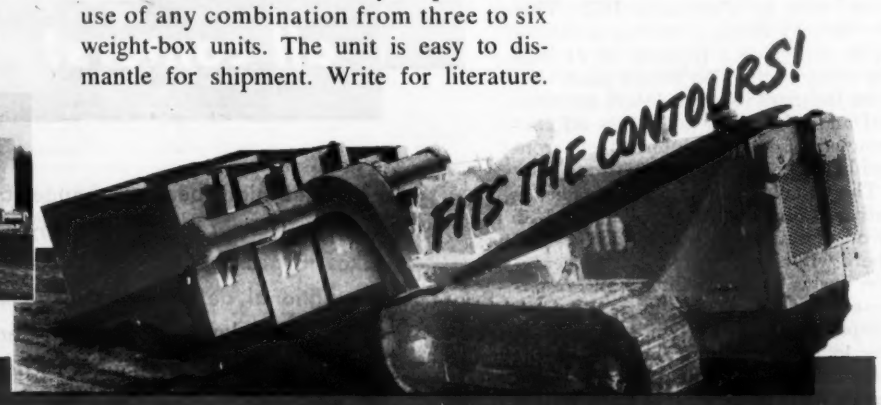
The weight-box units are hinged at the rear and oscillate independently.



For compacting earth fills!

UNEVEN GROUND CONTOURS cannot reduce the efficiency of the new Southwest Compaction Roller. As it travels over the variable surface of the earth fill each weight-box unit with its own wheel and tire oscillates independently up and down. Compaction is positively uniform because the weight on each tire remains constant—there is no bridging and no sudden shifting of load from tire to tire.

The sectionalized tubular yoke permits the use of any combination from three to six weight-box units. The unit is easy to dismantle for shipment. Write for literature.



CONSTRUCTION MACHINERY DIVISION
Southwest Welding & Manufacturing Co.
Alhambra, California

HAULING SCOOPS BULLDOZERS LOADERS BOTTOM DUMP WAGONS RIPPERS TAMPERS SCRAPERS TREE DOZERS

Norfolk, Va., Expands Its Waterworks System

(*Continued from preceding page*)

of a jet tank. The latter was a 3,600-gallon trailer tank with an 8 x 6 Moretrench pump mounted on a frame at the rear. After an initial filling to jet a few risers into the ground, the tank was kept refilled with water from the header line.

Only from 200 to 300 feet of trench was worked on at a time. As soon as this comparatively short stretch was dewatered and the trench excavated, the pipe was laid and the hole was backfilled at once. The wellpoints were then advanced and the operation was repeated; trenches were never left open over night. Joints were locked securely together by having the backhoe thrust the section it was setting firmly against the pipe already laid. A protruding steel lip with a groove containing a round rubber gasket made a tight lock; inside and out the joints were wiped with a sand-cement mortar.

Each crew averaged 400 linear feet of pipe installed in a 9-hour work day. This required keeping the wellpoints about 400 feet ahead so as to have dry ground to work in. The best day's output of one crew was 50 pipe lengths or 800 feet of line. No shoring was needed in these wide trenches dug in open country.

Elmer J. Bennett was Superintendent for A. Stanley Mundy & Co.

Old Plant Altered

Besides the tank foundations, the major part of Contract 6, as performed by the Lang Construction Co., consisted of extensive alterations and improvements around Moore's Bridges station. Connections were made from the existing filtration plant to the new 6,000,000-gallon tanks, and from there to the high-pressure pumping station. In the latter, an old steam pump is to be replaced with two new electric pumps, and two old electric pumps were replaced with new electric units. Necessary connections were also installed for water mains going to Virginia Beach and Camp Bradford.

A new low-lift pump station was installed for transferring the water from the filter plant up to the tanks. Improvements under this contract made obsolete the clear well basin and the suction well which were no longer needed with the new storage tanks and 48-inch supply line. By July, 1950, the necessary changeovers had been effected.

New Filtration Plant

Contract 7 for the new filtration plant also went to the Lang Construction Co. of Hampton, Va., on its low bid of $1,495,650. The project got under way in May 1950, and is scheduled for completion by February, 1952. Then the Moore's Bridges water-purification plant will have a capacity of 24 mgd, the same as the 37th Street plant. Besides the plant itself there will be chemical and laboratory buildings—all constructed of steel, reinforced concrete, and brick exterior.

The two old coagulation basins at the existing plant will be eliminated in favor of four new coagulation basins. There will also be four new sedimentation basins and four filters, all of concrete. The four new filters will have a capacity of 12 mgd, while the six filters to be rehabilitated will have the same capacity of 12 mgd. A new pump station will also be built at Lake Wright to lift the raw water into the plant.

Preliminary work at the site in the summer of 1950 included grading, which was handled with a Bucyrus-Erie scraper pulled by an International TD-18 tractor. A 15-foot-deep sump was dug at one end of the area to collect the water pumped from the ground by a well point system. The walls of the sump were lined with steel sheet piling driven by a McKiernan-Terry No. 7 air hammer handled by a Lorain Moto-Crane having a 40-foot boom. Air was supplied by an Ingersoll-Rand 500-cfm compressor.

The Lang Construction Co. is represented on the filter-plant project by Paul O. Key, Superintendent.

Personnel

The expansion of the Norfolk waterworks system is under the direction of the City Department of Public Works, Division of Water Supply. H. H. George is Director of Public Works, and R. F. Wagner is Chief Engineer. R. M. Arthur, Assistant Engineer, is in charge of field engineering for the Department.

Whitman, Requardt & Associates, Consulting Engineers, of Baltimore, Md., are consultants on the project, and are represented in Norfolk by Roy Ritter.

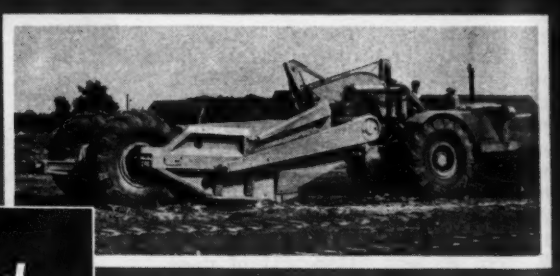
Tail-Gate Loader For Pickup Trucks

A new manually operated hydraulic tail-gate loader built expressly for pickup trucks has been developed by The Stratton Equipment Co., Hanna Bldg., Cleveland, Ohio. Called the Stratton Hydro-Loader, Model TG, it is designed to lift loads up to 650 pounds from ground to truck level in less than a minute. It is easily installed, the company says.

Further information on this new loader may be secured from the company. Or use the Request Card at page 16. Circle No. 137.

Loads of 650 pounds, from ground to truck level in less than a minute—that is the record of the Stratton tail-gate loader for pickup trucks.

2 giant new "Caterpillar" Earthmovers



...built to outspeed, outwork and outlast all comers!

With their high speeds and huge capacities, these two new "Caterpillar" Earthmovers have what it takes to push work through ahead of schedule. For national defense or private enterprise—on roads, dams, levees, airports or general construction—you can count on them for peak production.

Both these giants are powered by the new 225-HP., 6-cylinder "Cat" Diesel Engine. The 4-wheel DW20, with top speed of 26.6 m.p.h., is available with three matched units: the W20 Wagon, the No. 20 Scraper and the No. 20S 'Dozer. The 2-wheel DW21 has a top speed of 20 m.p.h. and trails the No. 21 Scraper. Features are described on the opposite page.

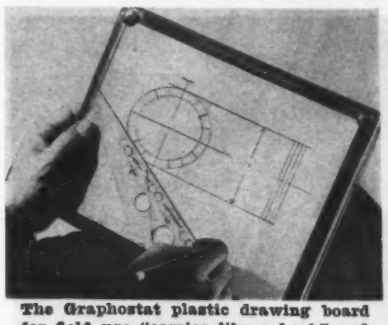
Here are typical reports on the DW20-W20 unit (25 cu. yds. heaped capacity): "You can run away from other rigs with it," says Operator Robert England. "The dump control is handy and easy to operate. It's got good brakes—you can stop it still, loaded. It's safe on turns and grades. It shifts easy and fast. The engine's got guts." Dragline Operator R. D. Johnson adds: "It's good and wide—you don't waste a bucket. It gets in and out faster than any I ever loaded."

New Portable Board For Field Drafting

A new portable drawing board molded from styrene plastic has been developed by A. Partrick Co., 9 Grove St., Westwood, N. J.

The Graphostat weighs less than 8 ounces. It may be carried like a book or set into a briefcase.

Four recessed corner clamps secure 8½ x 11-inch paper with a smooth unobstructed surface. Two metal straightedges, one vertical, the other horizontal, are retractable, thus eliminating the need for a T-square. Triangles can be stored on the underside of the drawing board by tension clamps. The board is equipped with rubber, skidproof, marproof feet for work on a desk.



The Graphostat plastic drawing board for field use "carries like a book" and fits into a briefcase.

Further information on the Graphostat may be secured from the company. Or use the Request Card at page 16. Circle No. 221.

Double-Helix Auger

A new twin-helix auger made to fit the Highway earth boring machine and, by means of adapters, all popular makes of power-driven earth-boring machines is now in production by Petersen Engineering Co., 4126 Twenty-Sixth St., San Francisco, Calif.

The Pengo augers are manufactured in nine sizes for hole diameters to 36 inches. They bore holes of diameters specified, Petersen says, avoiding waste of concrete when drilling for tower footings or cast-in-place piles or footings. In addition to drilling ordinary ground, the Pengo is said to bore holes in hardpan, decomposed rock, and some kinds of caliche and sandstone. Its twin-helix design eliminates back-thrust against the side of the hole, making it possible to drill with less caving in of sandy soil, the company states.

Pengo twin-helix augers for earth-boring machines are made in nine sizes for hole diameters up to 36 inches.

Each half helix has a shank plate with replaceable cutting points of abrasion-resistant alloy steel. Maintenance cost is said to be substantially reduced because wear takes place on the replaceable cutting points and pilot bit instead of on the auger itself.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 101.

Vibratory Soil Compactor

A new 16-page bulletin about the Cedarapids vibratory soil compactor, issued by Iowa Mfg. Co., Cedar Rapids, Iowa, describes the compaction of soil by vibratory pneumatic-tire rollers—a new development in recent years.

The Cedarapids compactor develops compacting action through pneumatic tires by means of a vibrator mounted on the axle. Emphasizing the importance of proper compaction for road bases and subbases which will stand up under heavy loads and provide long service life, the new bulletin describes in detail the action of the Cedarapids compactor and gives construction details of Models 60 and 25. Drawings show what happens to the soil under compaction. The bulletin contains job test reports made on various types of soil throughout the country.

This literature may be obtained from the company by requesting Bulletin COMP-3, or by using the Request Card at page 16. Circle No. 139.

New Safety Talks

Three new illustrated safety talks were released at the National Safety Congress in Chicago last October. The titles are: "Why Accident Prevention in the Construction Industry?", "Shovels, Cranes, and Draglines", and "Personal Protective Equipment". The talks contain visual aids to assist foremen in arousing interest in accident prevention.

For copies, write to the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill. The price is $5 each to Council members, $10 to non-members.

FWD Personnel News

The Four Wheel Drive Auto Co. of Clintonville, Wis., has created a new position on its staff to unite production and process-engineering functions. The post is that of Works Manager, and Donald B. Olen has been appointed to fill it, assisted by G. D. Simonds, Chief Engineer of FWD, and F. D. Hurley, Director of Manufacturing.

Clarence Piehl, former Manager of the Cost Department for the company, is now Executive Assistant to M. O. Stockland, Director of Sales. Mr. Piehl has been with the company since his graduation from high school in 1930. Douglas Frost, former Senior Cost Clerk, is the new head of the Cost Department.

THE DW20 TRACTOR AND W20 WAGON UNIT

This big-capacity unit offers:

17 cu. yds. capacity, struck; 25 cu. yds., heaped.

Travel speeds, through five gear ratios, from 2.88 to 26.6 m.p.h.

Wide-mouthed hopper to provide easy-to-hit target for shovel or dragline loading.

Controlled dumping — openings can be varied without mechanical adjustment — permitting either dumping or windrowing.

Accurate hydraulically controlled dumping with positive mechanical lock on dump doors.

The DW20 Tractor with No. 20 Scraper offers:

The same capacities, speeds and general specifications (except in type of gooseneck) as the No. 21 Scraper.

The DW20 Tractor is also available with the No. 205 Bulldozer.

THE DW21 TRACTOR AND NO. 21 SCRAPER UNIT

This big-capacity unit offers:

Full 90° turn each way—non-stop turn in 35 ft.

15 cu. yds. capacity, struck; 19½ cu. yds., heaped. With available 12" extensions: 18 cu. yds., struck; 22½ cu. yds., heaped.

Travel speeds, through five gear ratios, from 2.16 to 20 m.p.h.

Bowl and apron designed to promote "boiling" action of earth through center of load—for full-measure yardage, minimum loading time.

Large low-pressure tires for easy load flotation.

'Dozer-type ejection for positive "kicking out" of sticky material; dependable spring-action ejector return.

Open bowl design for visible loading under shovel or dragline.

Adjustable rear axle to permit level cuts and desired settings.

Double bottom of special alloy steel. Self-sharpening, reversible cutting edge.

High apron lift, low center of gravity.

Built to the exacting standards that characterize all "Caterpillar" equipment, these big yellow earthmovers are production boosters from the word "go!" What's more, your nearby "Caterpillar" dealer is on call for immediate service. For full information about these rigs, see him or write the factory.

•

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

DW20 AND DW21 TRACTOR FEATURES

NEW ENGINE: The completely new 6-cylinder "Cat" Diesel Engine . . . 225 HP. at 1900 r.p.m. available at the flywheel . . . 275 HP. peak capacity at 2000 r.p.m. tested in accordance with A.S.M.E. Power Test Codes.

TRANSMISSION: Constant-mesh transmission and heavy-duty clutch. Special locking device prevents gears from becoming disengaged.

STEERING: Hydraulic booster steering follows the natural "feel-of-the-road" hand guidance. Heavy steel stops keep gooseneck of drawn equipment from jack-knifing.

BRAKES: Each large, heavy-duty brake is 22" in diameter, 7" wide. Compressed air energized brakes on both tractor and drawn member of unit. Handy control valves for applying both sets of brakes, and to either right or left driving wheel.

OPERATOR COMFORT: Airfoam rubber cushion on bucket-type seat mounted on coil spring with hydraulic snubber. All controls within easy reach. Excellent visibility.

CATERPILLAR
REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS
MOTOR GRADERS • EARTHMOVING EQUIPMENT

Tandem-Axle Trailers

A new line of tandem-axle trailers known as the T Series has been announced by Mead Machine & Iron Works, Inc., 606 Lexington Ave., Warren, Pa. These units are supplied in dump-truck semitrailer models, in capacities up to 30 tons, and in conventional models up to 35 tons.

The company points to the following features of this newly designed series. Frame and gooseneck main members are alloy-steel sections and the assembly is electrically welded throughout. The tandem-axle units are fabricated from heavy steel sections, electrically welded to form a strong rocking beam. They are mounted independently of each other, and have 10 inches of oscillation in the forward and aft direction only to assure a constant alignment and reduce tire wear to a minimum, Mead says.

Mead's dump-truck semitrailer Model TD-30L, 30-ton capacity.

The brakes are of the two-shoe internal expanding type, fully enclosed and protected from weather. Hydraulically actuating cylinders have replaced mechanical brake rods, thus assuring constant equalized braking action regardless of the load and axle positions.

The non-tapering axle spindles are made of heat-treated special-alloy axle steel, mounting equal-size inner and outer tapered roller bearings. Standard equipment: turn signals and reflectors, a rear loading ledge, 6 lashing D's, a mat "kick up", and 1 tail-gate pickup.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 169.

Supercharged Diesel

A new supercharged two-cycle diesel engine, the Model G, has been announced by Zewo Mfg. Works, Inc., 140 Cedar St., New York, N. Y. It is designed for operation in the 1,000 to 1,200-rpm range, and for driving all types of machines that require an input in the 10 to 12-hp range. Suitable applications include saws, tractors, road rollers, pumps, and generator sets.

According to the manufacturer, Zewo diesel engines are made of high-grade material and are interchangeable and precisely manufactured. The crankshaft rides on ball bearings, whereas the piston pins and the cam tappets are supported by needle bearings. Drive-part lubrication is provided for by a separate oil pump. The engine is equipped with evaporator cooling, but may also be furnished with fresh-water or thermo-siphon cooling.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 110.

Extension-Cord Reel

A new heavy-duty cord reel furnished with either 25 or 45 feet of rubber-covered cord is announced by Industrial Products Co., 2855 N. Fourth St., Philadelphia 33, Pa. Available with various types of regular and vaporproof hand lamps at the cord end, it may also be furnished with a connector plug or without any wiring device if desired.

The cord is said to be nonkinking and nonfraying. The free-moving swivel mounting prevents binding. The reel has a constant retracting speed and will lock or release at any cord length. The sealed-in lubricant requires no attention. A special outlet design is said to keep the cord free of dirt and grease.

Equipped with a universal bracket for ceiling or wall mounting, the cord reel can be used in highway and contractor repair and service shops.

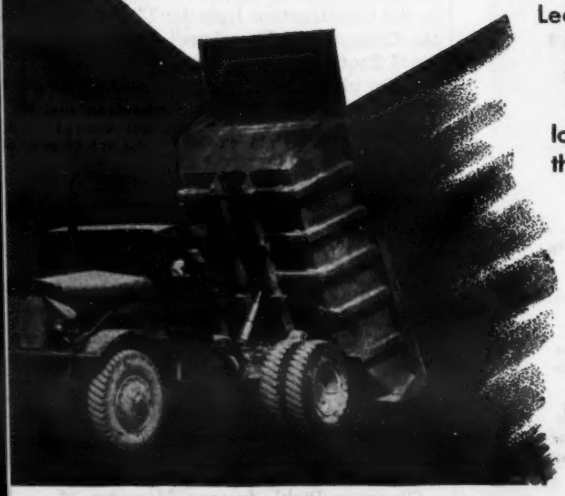
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 178.

A constant retracting speed and free-moving swivel mounting feature this heavy-duty cord reel made by Industrial Products Co. of Philadelphia.

OVER 60% OF ALL EUCLIDS SOLD ARE REPEAT ORDERS . . .

PROOF of CUSTOMER SATISFACTION . . . . .

PROFITABLE PERFORMANCE !



Leading contractors and industrial users buy "Eucs" because they are designed and built throughout for heavy off-the-highway hauling. And because Euclids are job proved for high production at the lowest cost per ton or yard moved, owners add to their fleets as more equipment is needed.

Nine out of every 11 Euclids built are still in use today. Their ability to stay on the job year after year under a wide range of operating conditions means more yards moved at greater profit.

Euclid owners also know they can depend on prompt, efficient service from Euclid's world-wide distributor organization.

Write for information on the complete line of Euclid equipment or see your Euclid Distributor today.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

EUCLIDS

Highway Conference In the Old Dominion

Virginia's Highway Commissioner James A. Anderson sounded the keynote of the Fourth Annual Virginia Highway Conference last October in his address on "One Highway System—One Highway Problem". Our one highway system doesn't stop at county lines or corporate limits, he said. "It can only be prosperous and flourishing when each and every mile, wherever located, is in condition to do the work it is called on to do." Breaking the city traffic jam is just as important, he said, as getting the rest of the farmers out of the mud.

Over 600 road engineers and public officials attended the meeting sponsored by the State Highway Department and the Engineering Department of the Virginia Military Institute to discuss Old Dominion street and road problems. They heard Senator Harry Byrd's appeal to "fight as long as you live any diversion of the state gasoline tax for any purpose except roads", and R. R. Smith's announcement that the Virginia Highway Users Conference, of which he is President, will do all in its power to see that overloading is stopped on Virginia's roads. Major General Philip B. Fleming, of the President's Highway Safety Conference, stressed the increase in rural traffic fatalities—22,000 as against 9,500 killed in urban areas. And Governor John S. Battle said that if the State needs to amend its traffic laws to cope with the safety problem, let it do so, "but I think strict observance of the laws we now have will do the job."

Joseph Barnett, Urban Design Engineer for the Bureau of Public Roads, called for a broad-front attack on the relief of traffic congestion in urban areas. Hal H. Hale, Executive Secretary of the American Association of State Highway Officials, said that the problem of highway financing will require for its solution the best brains in America. Maurice N. Quade, of the New York firm of consulting engineers that designed Virginia's George P. Coleman Memorial Bridge, described construction features of the $7,200,000 span now being built across the York River at Yorktown—especially its lightweight hollow pier bases and its two spring spans placed in tandem, each longer, he said, than any previous swing span built.

Exhibits, displays, a "family dinner", and a full-dress review by the VMI corps of cadets added color to the conference.

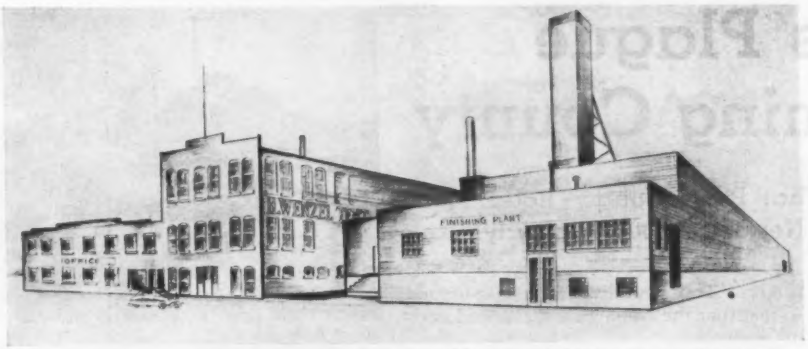
Wire Rope for Excavators

An 8-page bulletin making specific recommendations about wire rope for excavators has been prepared by John A. Roebling's Sons Co., 640 S. Broad St., Trenton, N. J. It outlines Roebling's experience in the wire-rope field and provides specifications on the rope recommended for shovel, crane, dragline, trench-hoe, and skimmer operations. It points out that for installations where unusual conditions of operation exist, or where machines have been redesigned or modified in the field, Roebling wire-rope engineers will be of assistance in selecting the right rope for each application.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 205.

Wenzel Expands Plant

The H. Wenzel Tent & Duck Co., St. Louis, Mo., has broken ground for an addition to its present tarpaulin-manufacturing plant. The addition will provide Wenzel and other midwest canvas manufacturers with facilities for producing, waterproofing, flameproofing, and mildewproofing canvas. It has been designed under the guidance of some of the topmost consultant engineers in textile finishing and contains modern equipment, testing and development laboratories, and research and experimental facilities. The laboratories will be at the disposal of Wenzel's customers and distributors for testing and research.

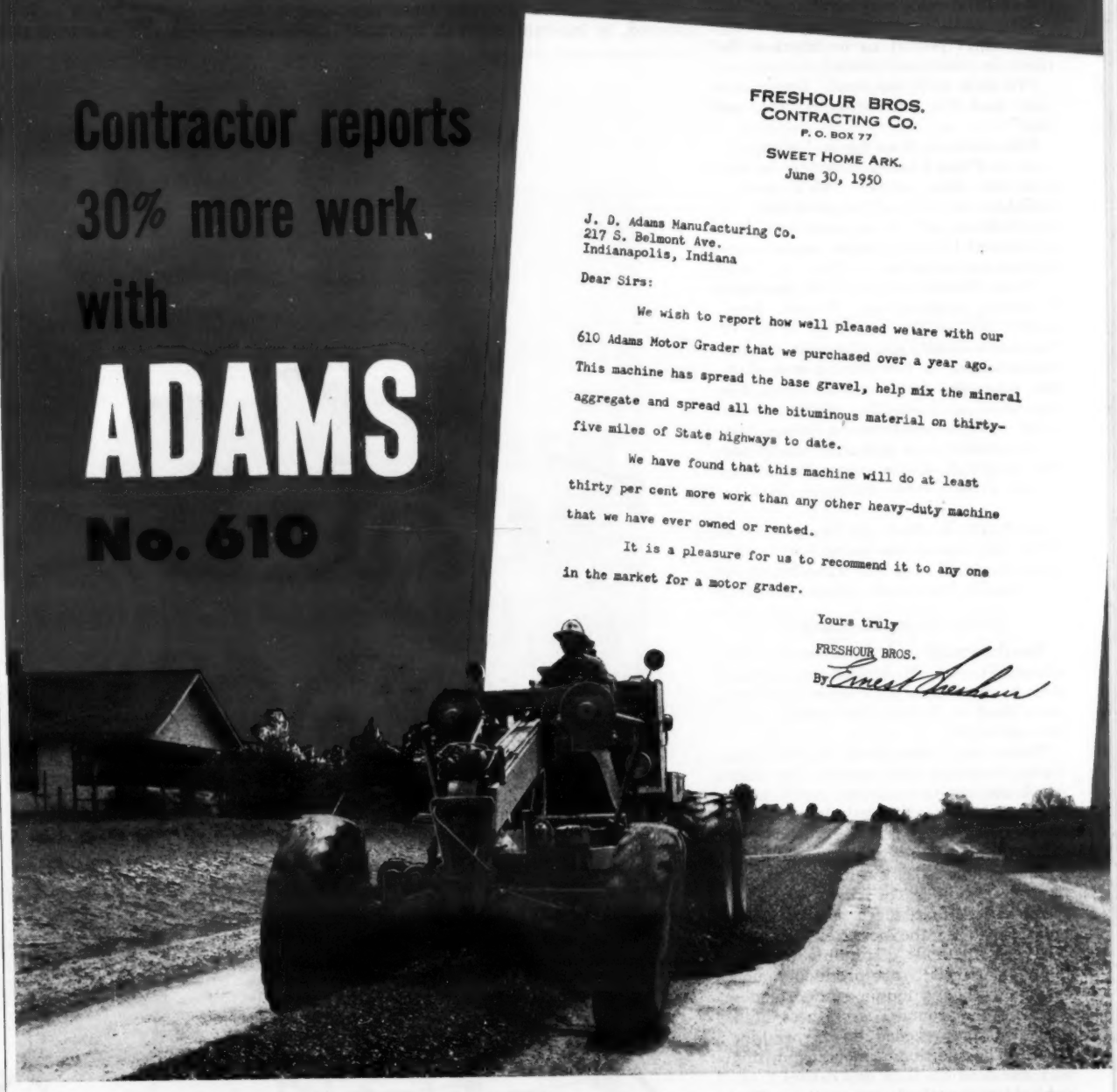


The Wenzel plant as it will look when the finishing-plant addition is completed. The new section will provide modern facilities for testing and research.

Photogrammetry Applied To Highway Engineering

There will be a symposium on "Photogrammetry as Applied to Highway Engineering" at the Annual Meeting of the American Society of Photogrammetry, January 10-12, at the Shoreham Hotel in Washington, D. C. William T. Pryor of the U. S. Public Roads Administration will head the symposium, and representatives of highway and public-works departments of California, Florida, Massachusetts, Michigan, Mississippi, and the Province of Ontario will participate.

Contractor reports 30% more work with ADAMS No. 610



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June 30, 1950

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We wish to report how well pleased we are with our 610 Adams Motor Grader that we purchased over a year ago. This machine has spread the base gravel, help mix the mineral aggregate and spread all the bituminous material on thirty-five miles of State highways to date.

We have found that this machine will do at least thirty per cent more work than any other heavy-duty machine that we have ever owned or rented.

It is a pleasure for us to recommend it to any one in the market for a motor grader.

Yours truly
FRESHOUR BROS.
By Ernest Freshour

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This experience is typical. King of all heavy-duty motor graders the Adams No. 610, with 100 H.P. diesel engine, has the weight, power and speed to handle toughest grading jobs faster, easier and at lower cost than any other graders on the market.

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Make your next motor grader an ADAMS

Dusty Roads Plague Mushrooming County

Tucson Is Growing So Fast That Pima County Road Men Are Hard-Pressed to Build New Dust-Free Highways

C. & E. M. Photo
A water tank sprinkler, shown here as it works with a motor grader, helps to solve the dust problem in Pima County.

✦ BRUCE B. ELLIS leaned back in his chair and tried to remember where he had seen this man before.

"My doctor sent me out here for my health," stormed the representative of John Q. Public. "You tell me how my lungs can improve when your dad-blamed county road dust chokes 'em up!"

"Where do you live?" Ellis asked.

The fellow mentioned a new subdivision and Ellis had the complaint tabbed. It tied in with others in the same vicinity, and the voice was familiar.

Ellis said, "Laws are a funny thing. They don't permit us to improve the roads in your subdivision."

"To hell with the law! I'm a sick man, and I'm interested in dust, not law!"

Ellis went on, drawing on his experience as Pima County Engineer to explain the fine points. "We'll send a sprinkler wagon out," he promised. "If you fellows will form your own Improvement District, maybe we can suggest an oil palliative . . ."

Bruce Ellis sits on one of the hot seats of county engineering. Tucson, Ariz., county seat of Pima County, is one of the west's rapidly growing cities. It has mushroomed so fast during and since the war that new subdivisions are springing up overnight. Streets dedicated in these subdivisions form a part of the county road system to the extent that residents blame every dust storm on the Pima County Highway Department.

That may be good. In five years the Pima road gang has grown with the problem, until now its organization is meeting the issue with relative success.

Dust—Major Headache

The dust problem is most acute in and around Tucson. Multiplied many times over by the influx of new people, Tucson's dust is so bad that people hate to mention it.

There is a theoretical explanation. Tucson has very little rainfall. The fines in all the new streets and roads wear away and blow off. Potholes develop. Large particles come loose. Residents complain about the dust and motorists damn the holes. It's an unhappy situation all around. The theoretical explanation is that there isn't enough moisture to tie the particles together.

Several methods of binding the soil together artificially are producing good results. When a motor grader blades a gravel road around Tucson these days, it is usually preceded by a sprinkler truck. The addition of moisture in this way moistens the fines and causes them to bind together the larger particles. The disadvantage to this method is that it is very costly, and water is much too limited. County maintenance men have to depend on the Tucson city water supply. With part of the homes rationed and lawns drying up, Tucson city fathers can't be too lenient with the limited supply.

Bituminous work can be done, and much is being done. It, too, has disadvantages. It can be done, according to the state code, only on the roads in the county system which have been established. That eliminates many a place which needs it. Last year 72.5 miles of new bituminous pavement was laid down in Pima County, and $1,500,000 was spent for maintenance and construction.

It didn't solve the dust problem, because people are moving in too fast from the east. Those subdivision roads spread so fast that the Department cannot keep up with them.

Where Pima County can't improve the streets because of state law, the residents can obtain relief by the Improvement District Act and organize an Improvement District. This takes 51 per cent of the property owners' signatures within the contemplated district. In due course the petition is brought to the County Board of Supervisors and the Improvement District is created.

An Improvement District, when organized, is incorporated and operates independently of the County, making road betterments with borrowed money on which the people can pay immediately or over a 10-year-period. Last year the Improvement Districts in Pima County laid 18 miles of new bituminous pavement out of the 72.5 total.

Science is now coming to the rescue, and it is believed that it will help the subdivisions. D. J. Hall, Associate Professor of Engineering at the University of Arizona, is running a series of asphalt penetration tests to determine a procedure for stabilizing Pima County road surfaces at low cost. SC-0 and SC-1 asphalts show a great deal of promise.

The county highway laboratory is pointing the way to proper flexible-base designs. It is equipped to handle

(Continued on next page)

soils tests like PI determination, sieve analyses, density, specific gravity, and Proctor characteristics. Pavement extraction tests and asphalt pavement mixes can also be studied. The laboratory is at the headquarters yard.

Scientific information, blended with practical knowledge which the road maintenance men had to get the hard way over the years, will solve the dust problem. One of the maintenance superintendents, for example, has found that asphalt will penetrate twice as far if the base course contains just a trace of moisture. Pima County is trying to tie information like that to the best-penetrating asphalt, to get the best results.

A Big County

Hearing the scream from city people about the dust problem, you might get the impression that Pima is mostly a metropolitan county. Not so. It's a big expanse of desert and mountains 164 miles east and west; about 56 miles north and south. There are 9,241 square miles. The county bounds Mexico to the south. Tucson is the biggest city.

County roads total a fraction over 1,541 miles. An even 200 miles are county-paved bituminous surface, with 255.65 miles paved by state and Federal activity over the years. About 753 miles are graveled and graded.

C. & E. M. Photo

A seal-coat crew puts down an upper-deck seal on a new stretch of highway in Pima County.

Pima County has one of the finest engineering organizations in the state. It's a former stomping ground of W. C. Lefebvre, now Arizona's State Highway Engineer. The county road organization, including both maintenance and construction, is centralized in Tucson. Small maintenance districts, responsible for as much as 200 miles, get their orders from county-seat headquarters. Six districts are located near the city, since that's the sore spot. Other districts are at Sells, Ajo, Sonoita, and Continental. Foremen of these districts usually have a motor grader, a limited crew, and whatever small equipment they need.

Postwar Fund—Heavenly Manna

You go in to the unpretentious meeting room of the Board of Supervisors, anxious to unravel the financial magic which lets Pima County start all the new construction you see going on. You meet Chairman J. Homer Boyd, quiet-spoken Arizonan who loves his state and its people. There's Lambert Kautenberger, whose first name sounds like cheese, whose last name sounds like beer, and who loves both; and youngish G. T. Alley, Commissioner from the copper mines out near Ajo. Richard Kolb, Supervisor's Clerk, is there, too.

You don't probe very far before you find out about "The Postwar Fund". That was manna from heaven. Without it . . . It's too unpleasant to think about.

The Postwar Fund is a broad piece of legislation passed by the Arizona Legislature about the end of the war. It authorizes county Boards of Supervisors to levy taxes for construction of public improvements sorely neglected during the war. It gives the Supervisors latitude. Its second purpose is to take up the slack in unemployment which Government economists predicted more or less erroneously. The law lasts until 2 years after "peace" is declared.

Last year the Pima Board played this law to the tune of $1,000,000. Practically all the money went into road building. Boosted by $500,000 of regular funds, it got things done. Jobs less than $10,000 went in with maintenance crews and equipment. Those which exceeded that figure were let to contractors. New equipment was purchased, but the County didn't go overboard.

Now to the Field

Let's go out and see how some of that equipment works. We'll visit a typical improvement project on the official county highway system—a section that got to the point where crews are going to do something about it.

First of all, the new road will be graded and straightened if necessary. Drainage will be built so it will be positive, because summer flash floods are one of the worst routine problems. Embankments will be set up so water can't pond ahead of them and saturate the new work.

(Continued on next page)

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Dusty Roads Plague Mushrooming County

(*Continued from preceding page*)

The new section will likely be designed for a 24 to 40-foot pavement, with 4 to 8-foot shoulders. Soils analyses determine the thickness of base course. That will be adhered to closely.

Bruce Ellis, and every road builder in Pima County, is a firm believer in base courses. Without a base, they say, what's the use of kidding yourself? They usually haul pit-run gravel to go on top of the compacted earth, but even that meets Arizona State Highway Department specifications—the bible for county road builders.

The top part of a base is select material. That might be produced a number of ways. A few pits throughout Pima County meet the gradation requirements as is, but they are the exception. Sometimes the fines have to be reduced; other pits call for their addition. Sometimes the deposits have too many coarse rocks, and crushing is in order. When crushed rock threatened to break the cost department at over $2.00 a ton, the County bought its own portable Pioneer outfit and smashed the price down to 53 cents.

Base material, hauled in by truck and spread, is then mixed by motor graders and laid down.

"No road-mixed pavement is any smoother than the base," say the field men. You watch the base polished to blue-tops and rolled to high density.

Select mineral filler then comes in, and eventually the asphalt transports. It might be MC or SC; Pima County uses a variety depending on the material. That cost sheet is hanging over their heads all the time, so the men haven't slugged the mineral filler with too many fines and they aren't going to waste any bitumen, either. Ten grand is going to build nearly 2 miles of road here.

The bituminous mix is rolled over and over by motor-grader blades, sometimes as many as 10 complete turns. When it is thoroughly mixed and aerated, the machines will lay it down and rollers will finish it off.

Arizona bituminous highways need seal-coating, too. Pima County tries to place seal asphalt and chips long before the highway loses its life and develops holes. One field man said that when a bituminous highway gets to the point where it is full of holes, you need a new highway, not patchwork.

C. & E. M. Photo
A Hughes-Keenan Roustabout crane holds a steel frame as a welder works, at Pima County's equipment-repair headquarters.

Another unusual piece of construction is being done by Federal prison labor under the supervision of the Bureau of Public Roads. Known as the General Hitchcock Highway, the 45-mile route rises to an elevation of about 8,500 feet at Summerhaven, formerly accessible only by an 85-mile trip through Oracle.

The County is furnishing equipment and operators for the work, and much is being done by hand labor because of the nature of the project. A camp is maintained on the road, and all supplies have to be hauled in.

Centralized supervision from Tucson lets the County use its maintenance foremen and equipment on work of this nature when the jobs are ready to go, and after the work is completed they go back to routine blading of gravel roads.

Flash floods which fill up stream channels under bridges are always a threat, and after any cloudburst there is always plenty of debris to clean up. Equipment on the county roster includes power shovels and dozers to remove the muck.

Work by the State Highway Depart-

(*Concluded on next page*)

IS RE-ROPING ONE OF YOUR "Headaches"?

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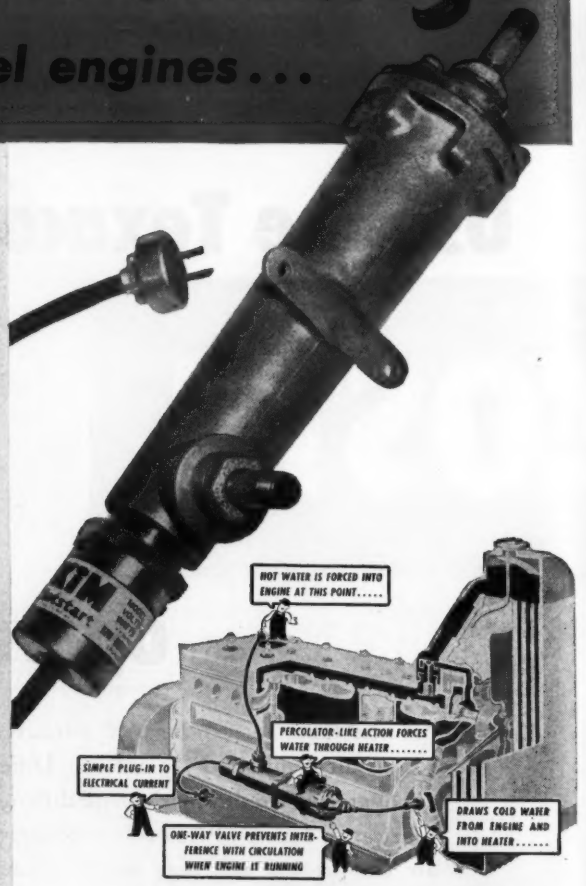
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C. & E. M. Photo
Pima County Engineer Bruce B. Ellis talks over a situation with Mrs. Douglas Holsclaw, one of his "public."

ment and participation by the Bureau of Public Roads is helping on both primary and secondary routes. But county people have a big job.

What? Nothing Else?

You contemplate the dust, the constant need for improvement, the ever-present deterioration, the influx of people, the never-ending compromises which must be made between economics and project justification, and you don't envy these Pima County road builders. You wonder maybe if they don't growl at those near and dear to them at the end of day, just to get even with somebody.

The telephone jangles. It's something else . . . right-of-way.

The days of the old west, when ranchers told highway engineers to take what they needed, are gone. Pima County tries to get at least an 80-foot right-of-way. Out in the saguaro cactus country the landowners say, "Whaddya yuh need all that land for; you gonna start a ranch?"

They try to get 80 feet near Tucson and the property owners scream their heads off. They say, "I can't spare that much land, my property is too valuable." Too bad we can't add dialect. It doesn't sound like Arizona.

The nearest thing to the old Arizona spirit is the way the men tackle the situation and do the best they can with it.

Text on Underpinning

A second edition of "Underpinning, Its Practice and Applications" has been announced. The new edition represents extensive revisions of the old one by authors Edmund Astley Prentis and Lazarus White, and it contains much new material about the advances made in the field since the first edition was published in 1931.

The authors—engineers and contractors with many years of experience in the design and installation of underpinnings—describe in detail actual cases of every type of underpinning. The text can be understood by persons having a limited experience in the field, and nearly 200 photographs and drawings illustrate it. Broad in its scope, this work also provides an introductory treatise on soil mechanics, information on specifications and legal aspects of underpinning and foundation work, and a glossary of terminology.

One of the most interesting chapters, which covers the raising and moving of structures, describes the moving of a 4-story structure weighing 3,000 tons a distance of 261 feet 6 inches. The 47-year-old building was carried on 300,000 steel balls 5/16-inch in diameter. The job is thoroughly illustrated.

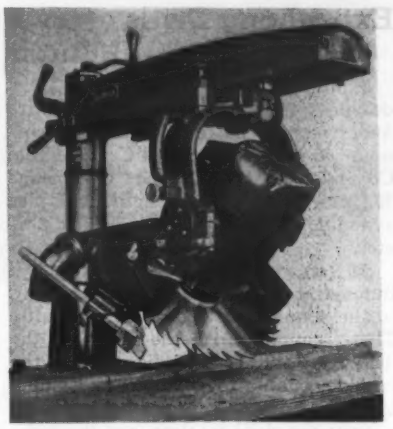
Many of the methods, appliances, and machinery described are the result of experimental work done by the authors themselves and by the staff of their company. Though these might be considered trade secrets, they have nevertheless been published with the thought that they will benefit the entire profession.

"Underpinning, Its Practice and Applications" is published by Columbia University Press, 2960 Broadway, New York 27, N. Y. The price of the text is $10.

New Radial-Arm Saw

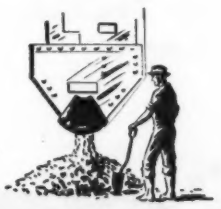
A new Model GR radial-arm saw has been announced by DeWalt, Inc., Lancaster, Pa. It features a DeWalt low-dead-rise direct-drive motor. The design of this motor is such that there is a reduction of the distance from the extreme bottom of the motor casing to the saw arbor. This reduction of distance allows the feeding of thicker stock. The motor is of the totally enclosed type, thereby reducing the fire hazard when the electric saw is in operation. It is equipped with grease-sealed bearings.

The Model GR is available with single-phase motors ranging from 2 to 3 hp ac or dc, and with polyphase motors from 3 to 5 hp. It comes in both the standard and medium arm sizes to give a wide range of cross-cut capacities. The use of a 14-inch saw blade gives a cutting depth of 4½ inches.



DeWalt's low-dead-rise direct-drive motor is the main feature of its new Model GR radial-arm saw. Thanks to its design, a 14-inch saw blade gives a cutting depth of 4½ inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 202.



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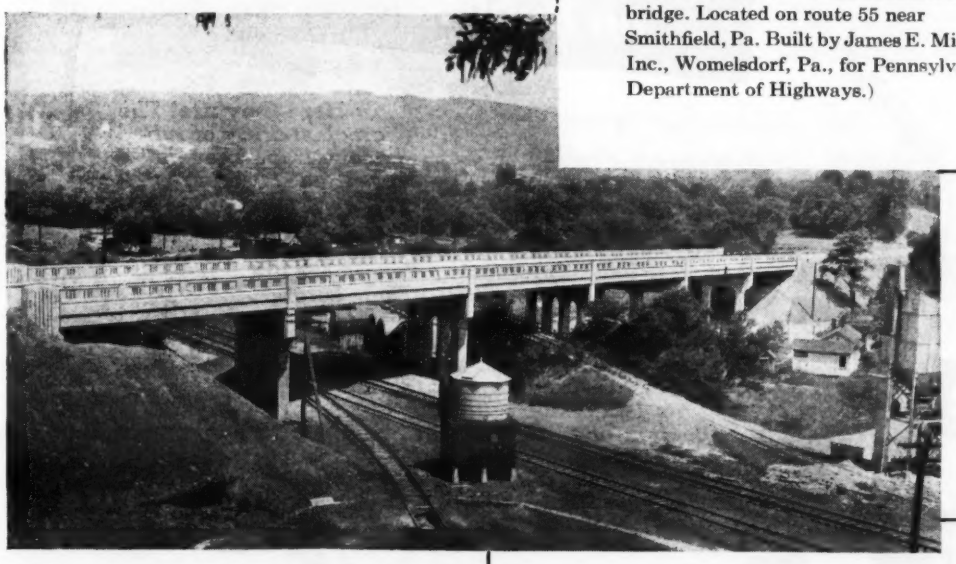

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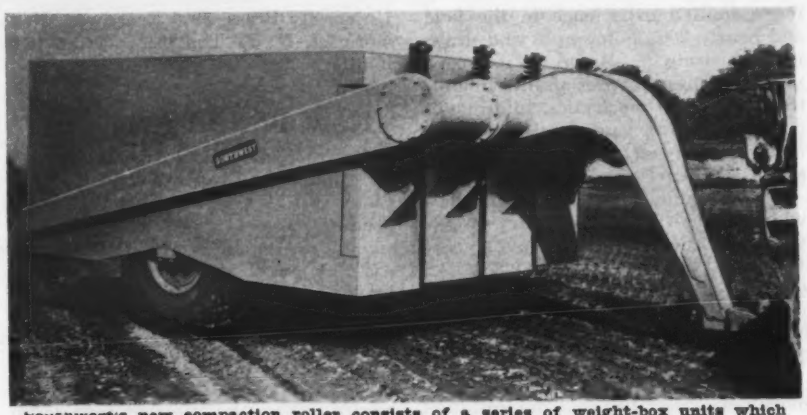
Extra-Long Drills With Spiral Flutes

Manufacture of the Cyclo-Twist double-spiral fluted drill in extra lengths up to 36 inches has been announced by New England Carbide Tool Co., Inc., 60 Brookline St., Cambridge 39, Mass. The extra-length drills are available from 3/16 to 1 inch in diameter.

An important feature is the two spiral flutes that run from both cutting edges to the shank end, regardless of length. These, coupled with the fact that the drill body is the same diameter as the carbide, enable the drill to expel dust as it works; thus it is not necessary to remove the drill to clean out the hole. These features help maintain a uniform drilling rate and permit more holes per sharpening of the carbide cutting edges, the company says.

Further information may be secured from the company by requesting Catalog CY-EX. Or use the Request Card at page 16. Circle No. 155.



Southwest's new compaction roller consists of a series of weight-box units which oscillate up and down to provide a constant compaction weight on each tire.

Flexible Unit-Type Compaction Rollers

A new, more flexible compaction roller is announced by Southwest Welding & Mfg. Co., Alhambra, Calif. It consists of a series of weight-box units, each equipped with a wheel and tire. These units may be filled with wet or dry sand, earth, steel scrap, or other materials. As the compaction roller is towed over the variable surface of earth fills, the units oscillate up and down and provide a constant and unchanging compaction weight on each tire, the company says. Thus there is no bridging nor sudden shifting of combined weight on any one or two wheels.

A sectionalized tubular yoke permits the use of any number from three to six of the weight-box units. By the same means the unit can be dismantled for easy shipment. Compaction loads range up to 15 tons per tire. Southwest states that the heavy-welded box-type gooseneck permits short turning in confined areas.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 220.

Catalog of Road Machinery: Blacktop, Concrete, Soil

A new 20-page catalog of equipment for construction and maintenance of city streets and rural roads has been issued by the White Mfg. Co., 1227 W. Beardsley Ave., Elkhart, Ind. A wide variety of machines is illustrated and described in catalog No. 32-D. Complete specifications are given.

The equipment manufactured by the company includes asphalt plants, kerosene burners, material dryers, concrete grinders, heaters, asphalt and tar kettles, lead melters, tractor loaders, pugmill mixers, pavement-repair trucks, tractor shovels, asphalt sprayers, kerosene torches, and concrete vibrators. Designed as a reference guide for equipment purchasers, the catalog includes data to assist in the selection of suitable plants for various types of work.

On the title page of the catalog is a poem we cannot resist quoting here:

I'm now arrived, thanks to the Gods,
O'er pathways rough and muddy,
Which surely shows that making roads
Is not this people's study.

And tho I'm not wi' Scripture versed,
I'm sure the Bible says
That wicked sinners shall be damned
Who do not mend their ways.
—Burns

This literature, with poem, may be obtained from the company, or by using the Request Card at page 16. Circle No. 147.

Winch-Line Wire Rope

A new 4-page folder recommending wire rope for winch-line service has been released by the American Cable Division of American Chain & Cable Co., Inc., Wilkes-Barre, Pa. It is one of a series of folders in which American Cable recommends a specific construction of wire rope for a particular kind of service, and gives reasons. For winch service the bulletin recommends American Cable wire rope with the following specifications: 6 x 36 Seale, Tru-Lay preformed, improved plow steel, independent wire-rope core.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 194.

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Hayward makes all three — clamshell, electric motor, orange peel. A Hayward recommendation is unbiased.

Trade HAYCO Mark

THE HAYWARD CO., 32-36 Dey St., New York

Hayward Buckets

How to Mothball Your Idle Equipment

Contractors, highway departments, and municipalities can put their power-equipment engines in mothballs during idle spells by methods developed for protecting military vehicles in storage, according to N. T. Brenner, Chief Fuels and Lubricants Engineer, Tractor Section, Gulf Oil Corp.

Trucks, bulldozers, snowplows, and other gasoline or diesel-driven vehicles in intermittent use will benefit from these procedures, Mr. Brenner asserted. Life is lengthened, operation improved, and cleanliness of internal parts guarded. The necessity of overhaul to correct rusting and corrosion caused by temporary lay-up is eliminated.

This protective lay-away is made possible by special oils, such as Gulf No-Rust Engine Oil, Grades No. I and II, created for military use in the past 10 years but now commercially available, Mr. Brenner said. Application is simple and requires no special equipment.

Here are the directions he gives for best results with gasoline and diesel engines:

Gasoline engines: drain crankcase when warm, fill to normal operating level with the protective oil, run engine 20 to 30 minutes at one-third to one-half normal operating speed. To protect cylinder walls, piston rings, and valves, shut off the ignition, spray 2 ounces of the oil into each cylinder through the spark-plug hole while rotating the engine by hand or by the starter (at least five complete revolutions of the crankshaft). Apply oil to metal parts of spark plugs including points and threads.

Diesel engines: follow same procedure for crankcase as with gasoline engines. Remove fuel injectors where possible, and spray at least 2 ounces of no-rust oil into each cylinder to protect piston heads and valves. Rotate engine as recommended for gasoline engine. Apply oil to threads and bodies of injectors. .

Fuel system of all engines: remove as much fuel as possible from the tank and run the engine without load until it stops for lack of fuel. No fuel should be left in the fuel system during storage. Spray inside of tank and filler cap threads with protective oil. In addition, thoroughly lubricate engine accessories. Completely drain cooling system.

According to the Gulf Oil Corp., its no-rust oils meet U. S. Army requirements, which include the ability to protect against high humidity and moisture condensation, to neutralize acidic products of combustion, and to be a satisfactory lubricant for spark-ignition and diesel internal-combustion engines. In addition these oils must have no harmful effect on metals used in engine construction. Since the no-rust oils are formulated to serve for a considerable time in the place of regular lubricants, the engine may be run on the no-rust oil without drainage when it is taken out of storage, until convenient to change, the company states.

Protective oils should also be applied to exposed engine metal, such as water-pump shafts or places where paint has cracked off, to provide an antirust coating. The oil serves as a general engine oil and as a protective lubricant for all tools and equipment subject to rust. Surfaces should be dried and the oil applied after use.

Flame-Hardening Catalog

A new flame-hardening apparatus catalog has been announced by Air Reduction Sales Co., Division of Air Reduction Co., Inc., 60 E. 42nd St., New York 17, N. Y. It contains descriptions and illustrations of the latest flame-hardening equipment, plus a section on "Tips for the Production Flame-Hardening of Special Shapes". Gas-control equipment and pipeline systems are discussed.

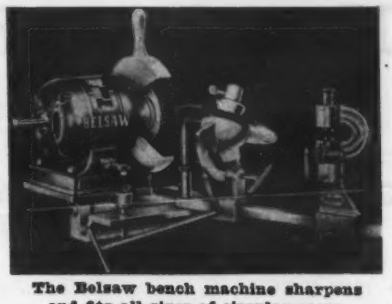
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 136.

New Bench Machine For Circular Saws

A new complete bench machine for sharpening and fitting all sizes of circular saws has been developed by the Belsaw Machinery Co., 315 Westport Road, Kansas City 2, Mo. It will handle jointing, gumming, tooth forming, and setting of all popular wood and metal-cutting circular saws, and it takes all saws from 4 to 48 inches in diameter with arbor holes from ½ to 2 inches.

The complete assembly includes a ¼-hp split-phase ball-bearing motor, a built-in "on" and "off" switch, an 8-foot rubber-covered cord and socket plug, and a dual-purpose wheel arbor operating in ball bearings. One end of the arbor is used for an 8-inch-diameter grinding wheel for saw work. The other end may be used as a bench grinder, flexible-shaft drive, etc. The adjustable arbor has a tapered cone which locks at a desired point on the supporting steel base arm. It grinds straight or bevel teeth left or right, from 0 to 45 degrees, with an accurate scale and pointer.

The unit includes a saw-set, mounted on the base arm, to give any desired set to points of saws from 6 to 48 inches in diameter. The set is made with a spring-loaded punch and anvil of hardened steel. No special hammer is required.



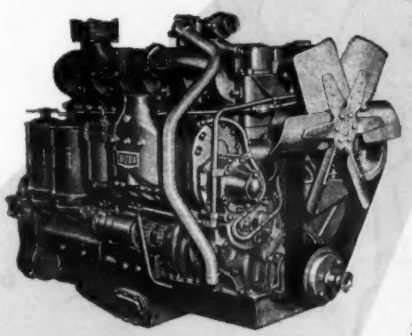
The Belsaw bench machine sharpens and fits all sizes of circular saws.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 125.

MORE POWER
BUDA 6-DAS 844
280 h.p. at 2100 r.p.m.

MORE POWER
CUMMINS NHS-600
275 h.p. at 2100 r.p.m.

...Now your choice in
LaPLANT-CHOATE MOTOR SCRAPERS

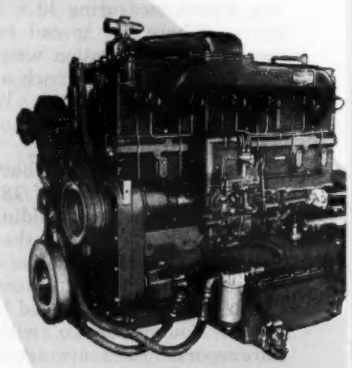


BUDA DIESEL 6-DAS 844—
Here's a newer, bigger Buda Diesel that gives you 20 h.p. per struck yard of capacity . . . a new high in power and performance!

HERE'S a power boost for the already powerful Motor Scraper . . . a step-up from 225 h.p. to your choice of either 275 or 280 h.p.! Two great Diesels, Buda or Cummins, whichever fits your set-up best. Power to spare in the toughest going! Power that's useable through a heavier final drive! Power that provides new highs in average haul road speeds!

In addition, you get all the original Motor Scraper features: — big capacity . . . big tires . . . double-acting hydraulic steering . . . four-wheel air brakes . . . faster, easier loading . . . positive forced ejection *plus* high apron lift, and many others — your assurance of more yards per trip . . . more trips per hour.

Don't overlook the profit potential of the TS-200—the little earthmoving giant in the 9 to 12 yard class, now available with the Cummins HRB-600, 165 h.p. Diesel.



CUMMINS DIESEL NH5-600—
275 h.p. that steps up Motor Scraper production performance and profits to new heights!

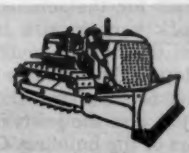
LaPlant-Choate Manufacturing Co., Inc.
Cedar Rapids, Iowa

LaPlant-Choate Sales and Service
1022 77th Ave., Oakland, Calif.

LAPLANT CHOATE

Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.

2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.



Hydraulic and Cable-operated Dozers.

New State Hospital For Shreveport, La.

Concrete for Framework Is Mixed at Job Site; 467 Bell-Bottom Piles, Also Spread Footings, in Foundation

✦ THE Confederate Memorial Medical Center, a 750-bed state hospital, is now under construction in Shreveport, La. When completed, it will replace the present Shreveport Charity Hospital on Texas Avenue, which will be turned into a state medical educational institution. The new medical center will serve northern Louisiana. A contract for the construction was awarded to J. A. Jones Construction Co. with offices in Shreveport and Charlotte, N. C.; the building will cost approximately $6,029,000. The big project got under way in July, 1949, and is scheduled for completion by September, 1951.

Located at the corner of Kings Highway and Linwood Street, the building is irregular-shaped because of its wings; it will measure about 400 feet across the front, 500 feet at the back, and 300 feet deep at the maximum. Total floor space is about 400,000 square feet. The greater part of the structure is 10 stories high, but in the rear one of the wings rises two additional floors. Associated Hospital Architects of Shreveport designed the medical center.

The main building has a reinforced-concrete framework of typical pan-slab construction. The front entrance portion, also the boiler house and laundry wing, is of structural steel with steel bar joists supporting the floors. Exterior walls, 11½ inches thick, consist of a buff brick facing backed with tile.

Foundation

First in the construction procedure was clearing the site of a rather dense growth of brush and small trees, before excavation got under way for the foundation. The building is supported both on piles and spread footings, the footings going under the taller part of the hospital. They are irregular in shape and size, of reinforced concrete, with the largest measuring 10 x 20 x 3 feet deep. Where the spread footings are located, the excavation went down an average of 10 feet to reach a firm stratum of clay and hardpan. Where piles are used, a cut was made only to the ground-floor level.

A total of 467 bell-bottom piles, spaced on an average of 18 feet both ways throughout the building, are under the major portion of the structure. They support both types of columns—structural steel and reinforced concrete. The pile work was handled by the Bell Bottom Foundation Co., with offices in Shreveport. Piles average 15 feet in depth with 36-inch-diameter shafts that are bored into the ground by an auger tool mounted on a truck. At the bottom, the shafts are under-reamed out to a 112-inch diameter. The bell thus formed makes a 60-degree angle with the pile shaft.

Reinforcing steel is placed down in the shafts, which are then filled with concrete. As many as 12 bell-bottom piles were completed in a 9-hour day. Concrete for the hospital project is furnished by the Braswell Supply Co., Inc., of Shreveport which has a batch plant one mile from the site. Transit-mix concrete was used in both the pile and footing pours.

Reinforced-Concrete Framework

Columns for the reinforced-concrete framework vary in size from 30 x 18 inches at the bottom to 12 x 12 inches at the top. The LaClede Steel Co. of St. Louis is supplying the reinforcing for the job, also the joists for the structural part of the building. Grade beams, interlocking between the columns, give additional strength to the structure and support the ground-floor slab. The J & B Mfg. Co. of Houston, Texas, furnishes the steel pan forms for the floor slab construction above the ground floor. Wood posts serve as shoring. Column forms are also built of wood. Formwork on the job was speeded with a DeWalt 16-inch-diameter-blade table saw that was set up in the carpenter shop at the site.

For the superstructure construction, not enough truck mixers were available to supply concrete in the large quantities that were required. So a 2-yard Mixermobile was brought to the project. A fleet of five trucks, each holding two 2-yard dry batches, delivered the cement and aggregate from the Braswell

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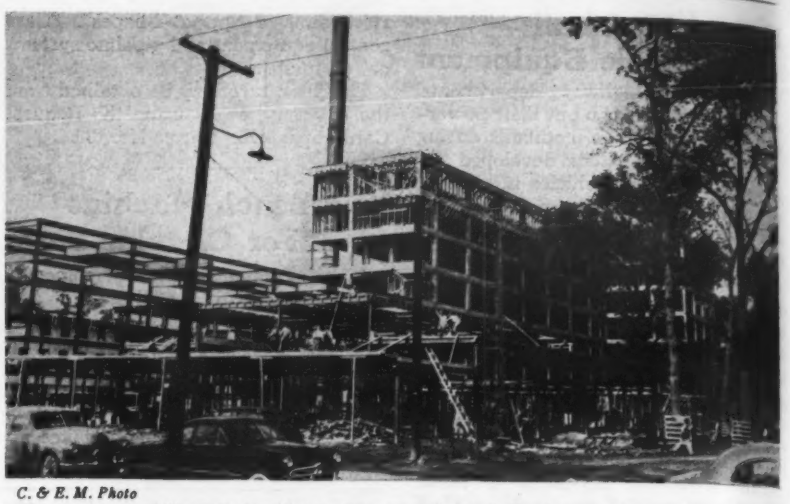
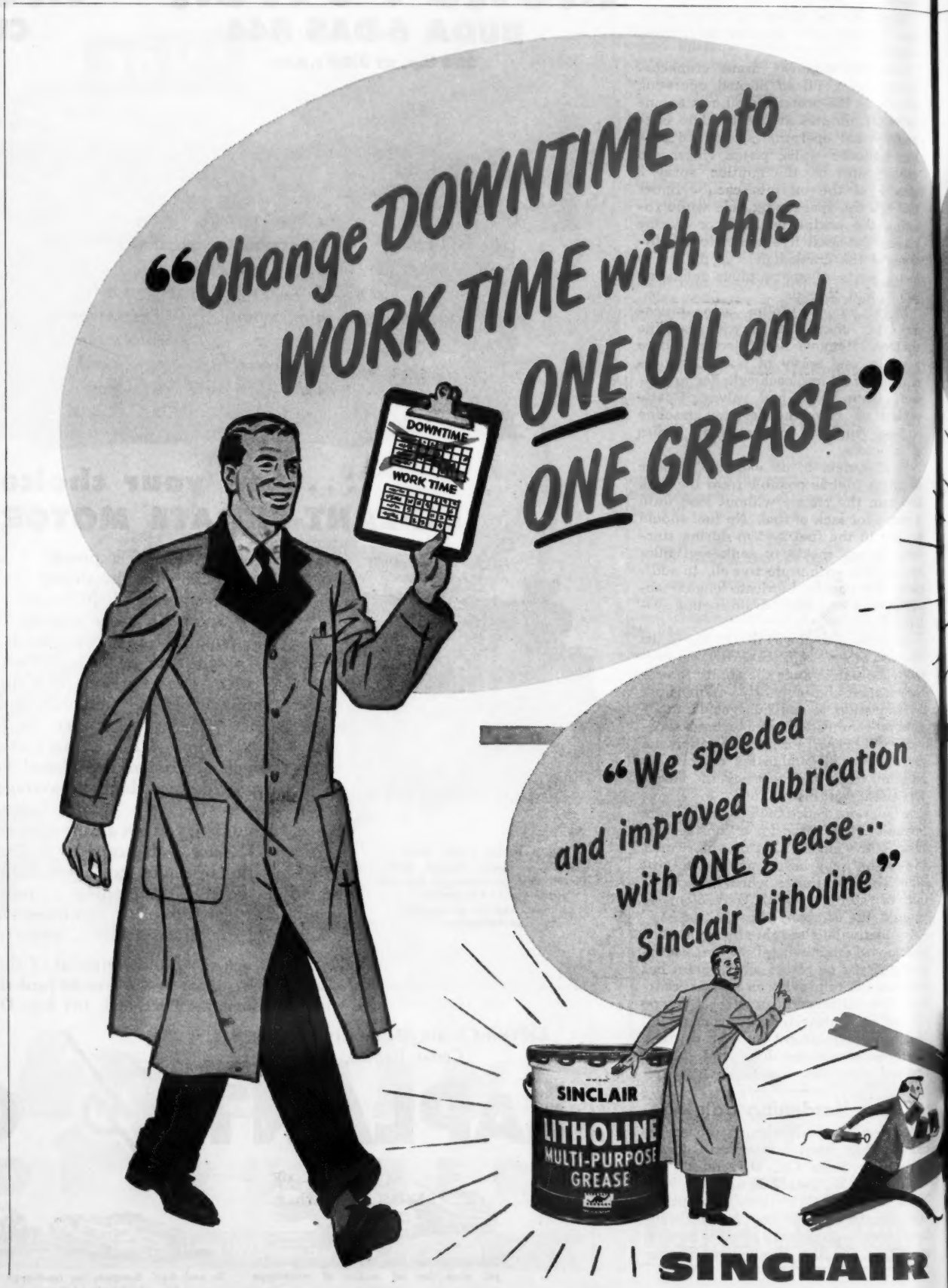
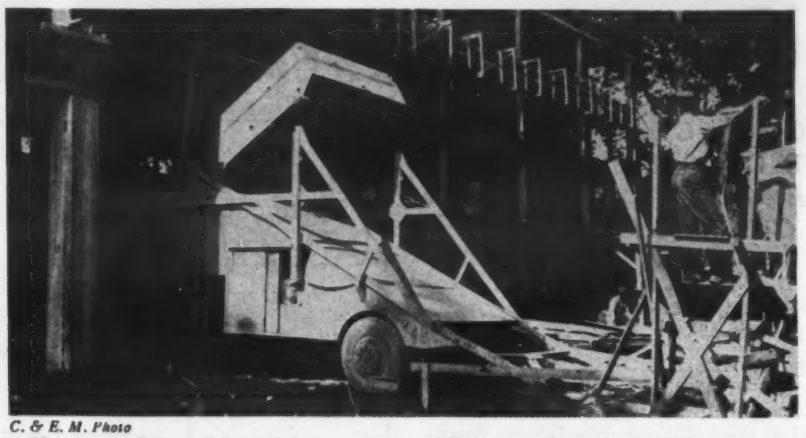


C. & E. M. Photo
The west end of the new hospital in Shreveport, the boiler house and laundry wing—with an American hoist and tower in the foreground.



C. & E. M. Photo
Formwork on the hospital job was speeded by a DeWalt 16-inch-blade table saw.



C. & E. M. Photo
Five trucks delivered dry batches to this 2-yard Mixermobile which mixed the concrete.

plant to the skip of the Mixermobile. City hydrants were tapped to supply water for the mix.

To place concrete above the ground-floor level, a double-cage hoisting tower, 196 feet high, was erected at the side of the building. It is operated by an OK. 2-drum hoist. From the mixer the concrete is discharged into a bucket on the hoist. The bucket is raised to the working level and emptied into a floor hopper. Georgia buggies then pick up a load of concrete, and are wheeled to the forms. The slabs are hand-screeded, and the concrete is cured with Hornite compound.

Steelwork

On top of the hoisting tower is a Chicago boom that lifts the heavy reinforcing steel from the ground to the desired floor. Construction materials were also hoisted to lower floors in the building with a shorter American hoist and tower.

Structural steel for the job is furnished by the Consolidated Western Steel Corp. of Orange, Texas. A crawler crane working on the ground erected the steel up to the level of the fifth floor.

Brick for the hospital is supplied by the Acme Brick Co. of Shreveport. Universal scaffolding was used for the walls and interior construction.

Personnel

The Confederate Memorial Medical Center, a state institution, is being constructed under the sponsorship of Earl K. Long, Governor of Louisiana. W. E. Reid, M. D., is Superintendent of the existing Shreveport Charity Hospital.

A force averaging 400 is currently engaged in the hospital construction. The J. A. Jones Construction Co. is represented on the project by G. T. Littlefield, Superintendent. Benton L. Kelley is Vice President and Branch Manager of the contractor's Shreveport office which is directing the construction.

Cold-Weather Concreting

A 16-page informative brochure on methods of minimizing winter concreting costs with Incor, a 24-hour cement, has been issued by the Lone Star Cement Corp., 100 Park Ave., New York, N. Y. This literature explains that winter concreting is entirely practical "in our day". It discusses the ways in which temperature variations affect the strength and quality of concrete, pointing out that better mixes pay dividends in winter.

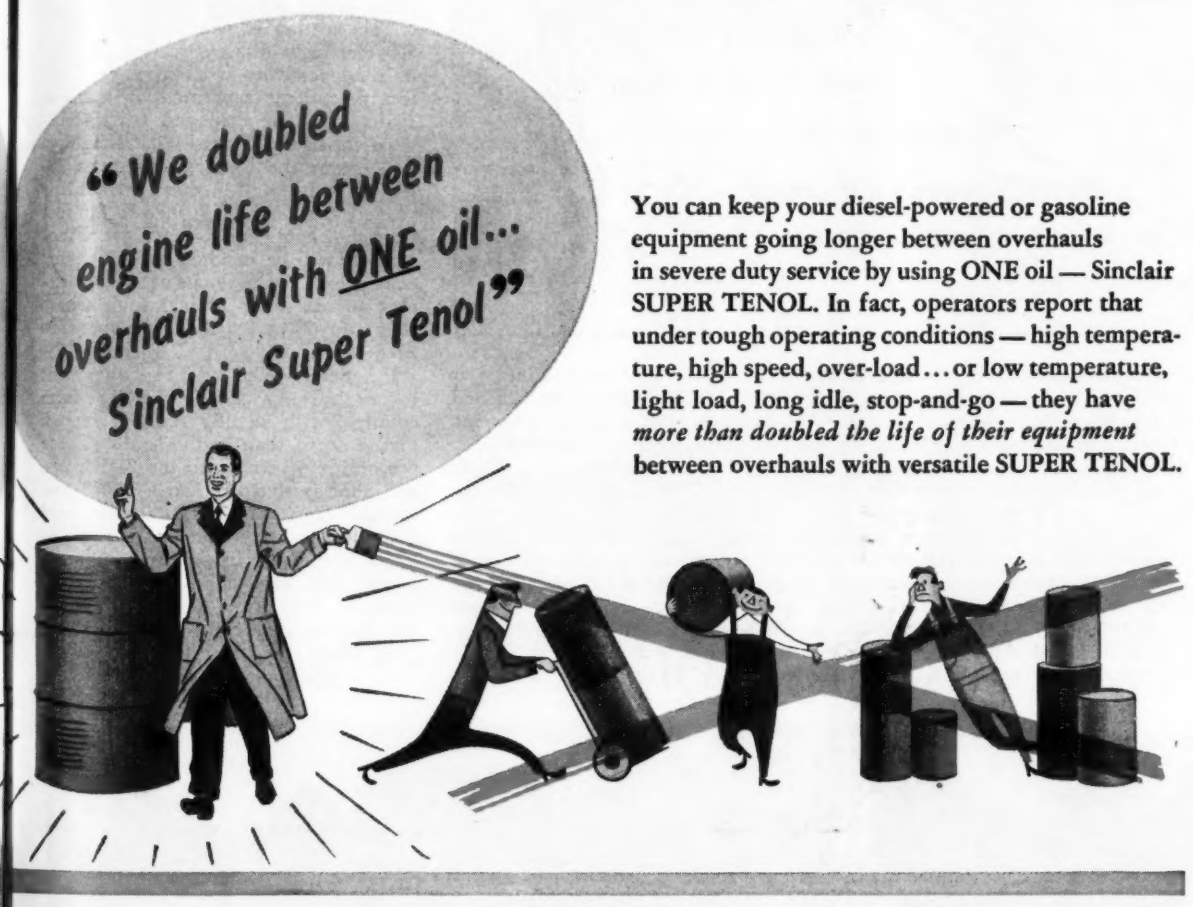
Data on winter concreting methods with standard concrete and with Incor are tabulated for convenient reference. Principal data include the compressive strength in pounds per square inch, at temperatures ranging from 20 to 70 degrees, for various water-cement ratios, slump, and mix proportions, at ages ranging from 1 to 28 days.

A number of typical cost comparisons on jobs done in various ways are included in this folder. These comparisons take into account the total amount of cement being used, the total volume of concrete poured, heating costs, costs of forms, and savings that may be made in total construction time. A large portion of the brochure is devoted to recommendations for winter job practice, such as adequate heat protection methods. On-the-job photographs illustrate winter operations.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 183.

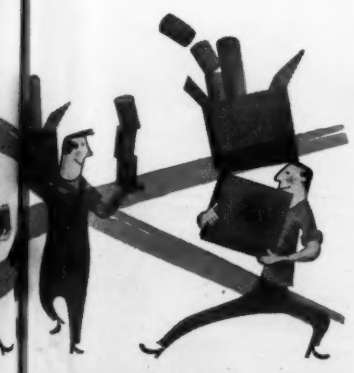
Twin Disc Appointments

Paul W. Wahler, formerly Assistant District Manager on the west coast, is now Service Manager for the Twin Disc Clutch Co., Racine, Wis., and Robert A. Harmon, formerly Eastern District Sales Engineer, is Dealer Sales Supervisor. Both men have their headquarters in Racine.



You can keep your diesel-powered or gasoline equipment going longer between overhauls in severe duty service by using ONE oil — Sinclair SUPER TENOL. In fact, operators report that under tough operating conditions — high temperature, high speed, over-load... or low temperature, light load, long idle, stop-and-go — they have *more than doubled the life of their equipment* between overhauls with versatile SUPER TENOL.

Consider how you can cut downtime and grease inventories by using ONE single grease for the complete lubrication job. Sinclair Litholine provides better lubrication than long-established specialized greases. And that means for *all* lubrication points — chassis, wheel bearings, water pumps, universal joints — in winter or summer, under all kinds of operating conditions. Litholine gives you —



1. Superior protective lubrication at *every* point.
2. No danger of costly misapplication.
3. Quicker servicing, less downtime.
4. Smaller grease inventories. One grease instead of from three to four.
5. Fewer dispensing units.
6. Less chance for contamination.
7. Simplified purchasing and distribution.
8. Less wastage.

Sinclair will gladly send you a folder describing demonstrations showing the superiority of Litholine over other greases.

SUPER TENOL AND LITHOLINE

N. J. Turnpike Ready for Paving

Grading Contracts Are Rushed To Completion; Alternate Bids Are Taken for Bituminous or Cement-Concrete Pavement

By WILLIAM H. QUIRK,
Eastern Editor

✦ CONSTRUCTION is active along the entire 118 miles of the New Jersey Turnpike, from Ridgefield Park (Route 6) in the north, near the George Washington Bridge, to Deepwater in the south at the new Delaware Memorial Bridge. Grading, drainage, and structure contracts have been under way since February, 1950, shortly after the first contract was awarded by the New Jersey Turnpike Authority in mid-January. In December all paving contracts will be awarded so that contractors may have time to stockpile materials and assemble their plants for intensive paving operations next season. The scheduled date of completion of the Turnpike is November, 1951.

Bids for extra-heavy-duty pavements of alternate types were called for—either portland-cement concrete or bituminous concrete—and thick enough to withstand heavy axle loadings. The cement-concrete design called for a 10-inch reinforced slab on a 6-inch subbase, while the bituminous or flexible-type pavement specified a 4½-inch asphaltic-concrete hot plant-mix surface laid on an 8-inch macadam base over a 6-inch subbase. Below both types of pavement will be a thick layer of granular frost-free free-draining material of high bearing power. The Turnpike is divided into seven sections, with a single paving contract for each section. Thus a series of transitions from one pavement type to another are avoided. Maintenance also can be handled better with long stretches of the same type of pavement.

Some paving is expected to be done this winter, weather permitting, but the bulk of it will be done next season. By the end of this year the major part of the grading, drainage, and structure foundations will be finished. Besides

(Continued on page 22)

Contractors are submitting alternate bids to the Turnpike Authority on bituminous-concrete and portland-cement-concrete paving. On all seven bids received, hot-mix has been the low figure—lower by an average of $770,000 per contract. The hot-mix bids are running about $400,000 a mile; the concrete, $450,000.

On contract No. 59 (20.4 miles) Eastern Engineering Co., Atlantic City, N. J., was the hot-mix low bidder, with bids ranging from $6,217,725 to $6,624,725, depending on the type of shoulder. On No. 60 (18 miles) the low bids of Savin Construction Co., East Hartford, Conn., ranged from $5,299,087 to $5,622,087. George M. Brewster & Sons, Inc., Bogota, N. J., was low man on contracts No. 61 and 62 (21 and 24.5 miles respectively) with bids ranging from $6,040,855 to $7,662,276. On No. 63 (14.2 miles) S. J. Groves & Sons, Woodbridge, N. J., set a low price of from $6,226,696 to $6,492,696. On No. 64 (10.6 miles) Gull Contracting Co. and Tully & DiNapoli of New York were low with figures of $5,632,695 to $5,805,495. On No. 65 (7.4 miles) Brewster was low again, $3,193,100 to $3,345,350.

Grandview's 24½ Miles Is Longest Grading Contract on Project; Equipment Averages 30,000 Yards in 10-Hour Day

✦ OUTSIDE of being the longest contract on the New Jersey Turnpike, Contract 9, covering grading and drainage for the 24½-mile Section 4, is fairly typical of the construction on the southerly portion of the new superhighway. Contract 9 reaches into two counties—Mercer and Middlesex—extending from the vicinity of Allentown on the south to the banks of the Raritan River on the north. The New Jersey Turnpike Authority split the section in two with contracts 9A and 9B, but both went to the Grandview Construction Corp. of Mt. Vernon, N. Y., the low bidder. The combined low bids totaled $2,716,065. The forty-one bridge structures and grade separations along the way are handled by other construction firms under separate contracts.

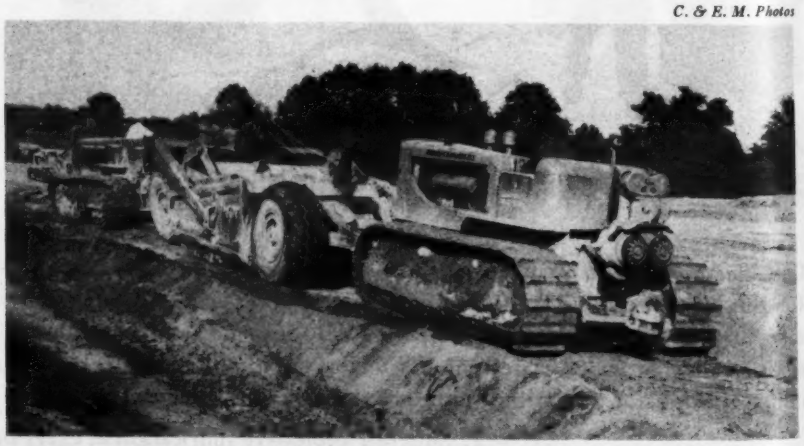
This section of the Turnpike has a 300-foot right-of-way throughout. The finished roadway will carry dual 24-foot pavements separated by a raised 16-foot median strip and two 5-foot-wide inner shoulders. With shoulders and berms the roadway averages 109 feet in width, and in this contract it is graded to a slope of ¼ inch to the foot from the center line to the edges. Fine-grading will be handled by the paving contractor. Front slopes are 4 to 1 except in fills over 10 feet high where they are 2 to 1; all backslopes are 2 to 1.

Practically the entire alignment passes through gently rolling farm country, with slightly rougher terrain in the north than in the south. There are only nine curves in the 24½ miles, and none is sharper than a 10,000-foot radius. Tangent lengths were held down to 2 miles as much as possible to avoid monotony in driving. Material in the cuts ranged all the way from muck to first-grade sand and gravel, the only type missing being rock. In most areas the water table was high,

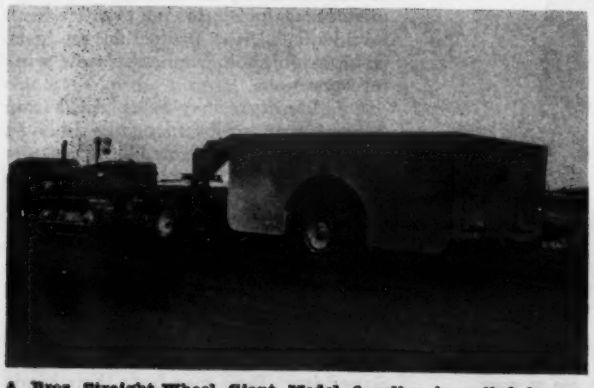
(Continued on page 25)

C. & E. M. Photos

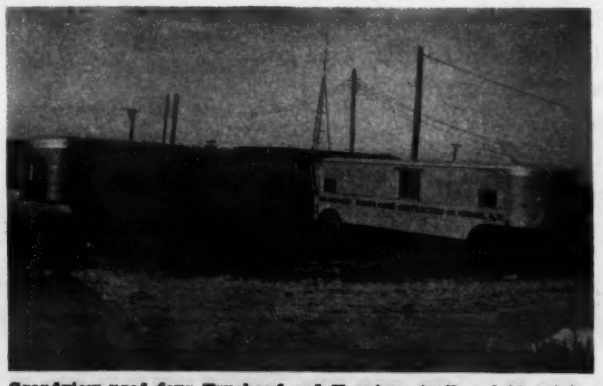
Grandview's Northwest 80-D shovel loads a bottom-dump Euclid in a borrow pit.



A Bucyrus-Erie scraper pulled by a TD-24, pushed by a HD-19, loads up in a cut.



A Bros Straight-Wheel Giant Model 6 roller is pulled by an Allis-Chalmers HD-14 tractor.



Grandview used four Fruehauf and Keystone trailers laid out in the form of a cross for its field offices.

Project Manager Jim Mirabelli gives an order over his Link radiophone.

Sand Drains Stabilize Fills Over Meadows on Brewster Job Near Lincoln Tunnel; Borrow Moved In by Rail

♦ THE largest grading and drainage contract on the northern end of the New Jersey Turnpike, where sand drains are employed in fill stabilization, is a 4.5-mile stretch that the New Jersey Turnpike Authority awarded to George M. Brewster & Sons, Inc., of Bogota, N. J., on its low bid of $6,890,081. Known as contract 18 on Section 7 of the superhighway, it begins at Wiegands Lane in Secaucus, Hudson County, on the south, and extends northerly to a bridge over the New York, Susquehanna & Western Railroad yards in Ridgefield, Bergen County. It also includes approach ramps to and from the Lincoln Tunnel, a distance of approximately 7,000 feet. Work got under way in June, 1950, and is scheduled for completion by June, 1951, which will still allow time for the paving to be finished by November, when the Turnpike is expected to open.

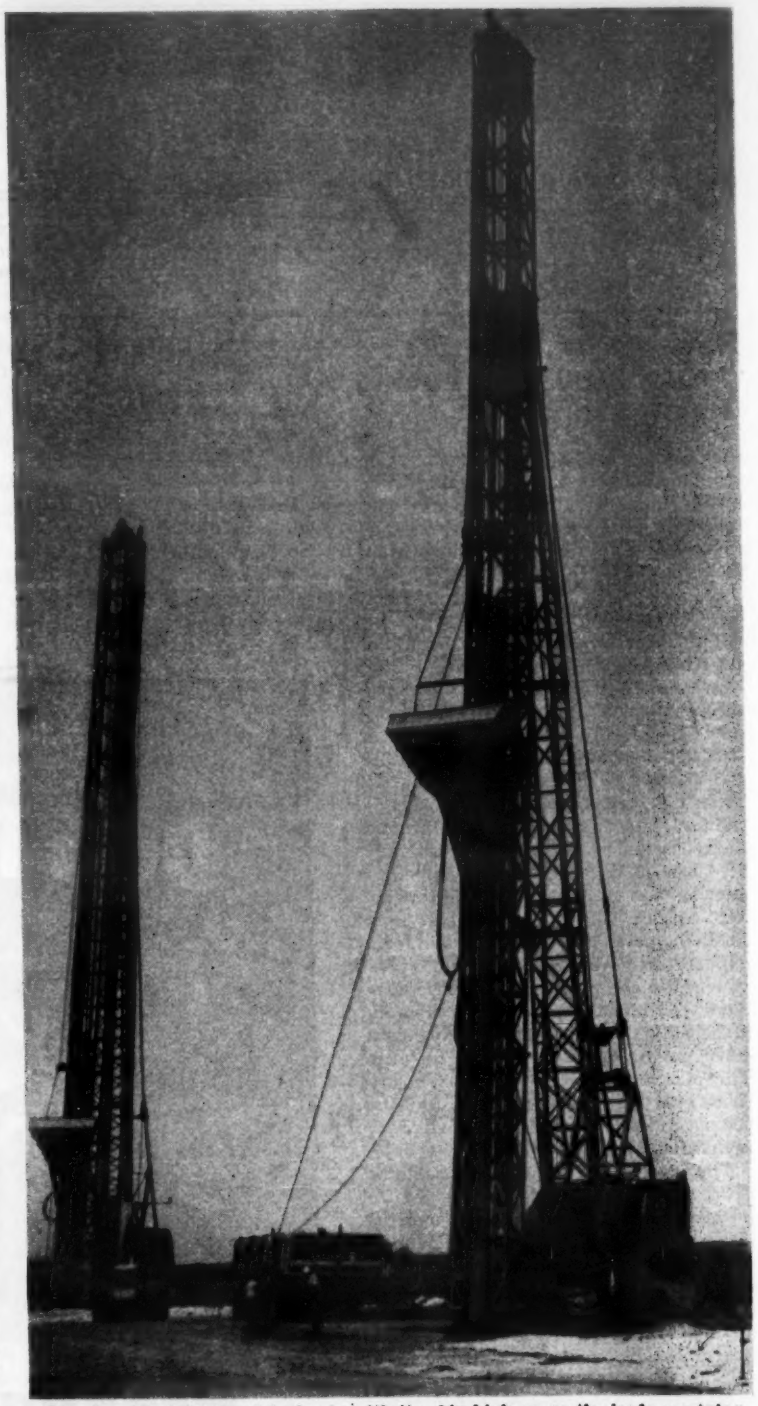
For the lower 1⅓ miles, up to the Route 3 interchange connecting to the Lincoln Tunnel, the roadway across the 250-foot right-of-way will be the dual type, with three 12-foot traffic lanes on each side of a dividing median strip at least 20 feet in width including the inside shoulders. Ultimately this portion will be widened to an eight-lane dual-dual highway. North of the interchange the roadway will also be the dual type, but with only two 12-foot traffic lanes on each side of the median. Provisions are made, however, for the ultimate expansion to six lanes. Each of the two approach ramps connecting to the Lincoln Tunnel will accommodate two lanes of traffic.

This section of the Turnpike crosses the low, flat, meadow marsh east of the Hackensack River where fills must be built up to an average 10-foot height above the ground. The maximum fill was 39 feet, and the deepest cut was only 12 feet near the Secaucus Road. Some rock was encountered in an old spoil dump where muck from the Lincoln Tunnel excavation had been wasted. But over practically the entire job, the new technique of sand drains and sand blankets was used to stabilize the soft soils, and give the Turnpike a firm foundation. This procedure as-

(*Continued on page* 28)

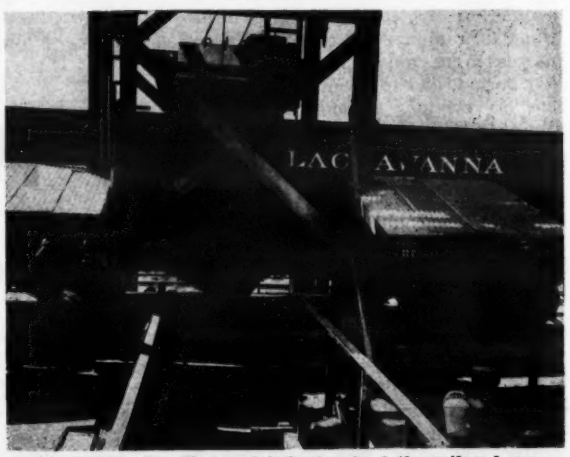
A Hough Payloader dumps a 1-yard load of sand into the McKiernan-Terry skip of a Manitowoc 3500 Speedcrane. A McKiernan-Terry 10-B-3 hammer in the 115-foot leads drives a mandrel for an 18-inch sand drain 20 feet deep.

The skip is raised in the leads of the Speedcrane and sand discharges into the mandrel.

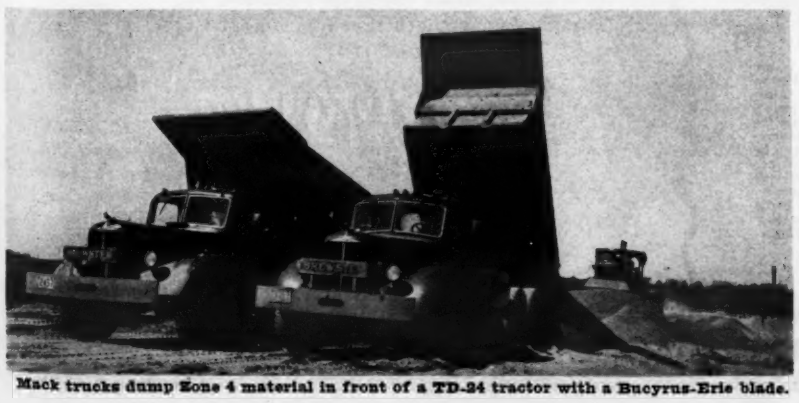


Here is a Koehring sand-drain rig with its skip high up on the leads emptying into the mandrel. The Model 1005 rig is using a McKiernan-Terry 11-B-3 hammer.

At the D. L. & W. RR siding, mine tailings for the fill drop from Blaw-Knox hoppers into Mack trucks.

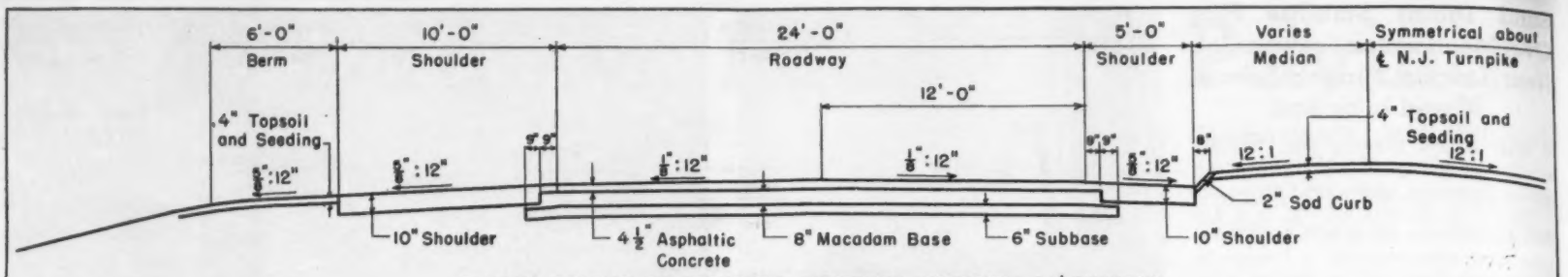


This Robins Car Shakeout helped unload the railroad cars.



Mack trucks dump Zone 4 material in front of a TD-24 tractor with a Bucyrus-Erie blade.

A Caterpillar D8 pulls a 62-ton Super Compactor, Model 100, over the fill.



TYPICAL SECTION OF ASPHALTIC-CONCRETE PAVEMENT 24' ROADWAY

New Jersey Turnpike Is Ready for Paving

(*Continued from page 20*)

the paving in 1951, the construction schedule calls for the completion of the bridge superstructures and deck slabs, toll plazas, service buildings, restaurants, gas stations, and administration facilities.

Toll Road

The New Jersey Turnpike is a toll superhighway being constructed by the New Jersey Turnpike Authority — a three-man nonsalaried body created by the New Jersey State Legislature in 1948 to construct, maintain, and operate the Turnpike. Its chairman is Paul L. Troast, a Passaic, N. J., building contractor. The total cost will be around $220,000,000, of which approximately $174,000,000 is for right-of-way, engineering, and construction. The remaining $46,000,000 covers interest and financing costs, administrative and legal expenditures, repayment of funds advanced by the State Highway Department, contingencies, and approximately $10,000,000 that the State had spent on construction on Route 100. Thus the Turnpike will be one of the most costly roads ever built, averaging over $1,900,000 per mile. Portions of the North Jersey sections will cost $8,000,000 per mile.

The project is financed by the sale of revenue bonds to a group of some 52 private institutional investors, mostly insurance companies. No public funds are anywhere involved. The bonds are secured and pledged solely by revenues from the Turnpike. When they are paid off, the 118-mile toll road will become free, and will be incorporated into the state highway system. This is estimated to take from 25 to 35 years. Toll charges have not as yet been definitely fixed.

The two-year time limit placed on the completion of construction was established to minimize the amount of bond interest to be paid during the construction period, and to permit the production of revenues as soon as possible. Engineering reports estimate that an average of 9,910.000 vehicles will use the Turnpike each year in the first five years of operation. Total revenue during that period, including monies from concessions, is expected to average $10,030,000 a year.

Engineers and Contractors

After the New Jersey Turnpike Authority was established, Charles M. Noble, State Highway Engineer of the New Jersey State Highway Department, was loaned to the Authority, and shortly thereafter was appointed to serve permanently as its Chief Engineer. For simplification, the 118-mile superhighway was divided into 7 sections, and eight firms or groups of firms of consulting engineers were assigned to design, prepare plans and specifications, and to supervise the construction of the Turnpike under the direction of the Chief Engineer.

Howard, Needles, Tammen & Bergendoff is the general consultant for all sections, and also for the bridges on Section 7. Firm headquarters are in New York City. The other engineers are: Section 1—J. E. Greiner Co. of Baltimore, Md.; Section 2—Gannett, Fleming, Corddry & Carpenter, Inc., of Harrisburg, Pa.; Section 3—Parsons, Brinckerhoff, Hall & Macdonald of New York City; Section 4—De Leuw, Cather & Co. of Chicago, Ill.; Section 5—Fay, Spofford & Thorndike of Boston, Mass.; Section 6-7 (Highway)—Edwards & Kelcy, Frederic R. Harris, Inc., O. J. Porter & Co., Associated of Newark, N. J.; Section 6 (Bridges)—Ammann & Whitney of New York City.

Section numbering is from the south to the north. The greater number and larger-size bridge structures are found in the northern part of the route as it passes through the more heavily populated and industrialized areas of the state.

By September, 1950, fifty contracts had been awarded to low bidders by the Authority, in amounts ranging up to $7,288,810 for a single contract. The latter was awarded to the Bethlehem Steel Co. for the Passaic River bridge superstructure. Competition was keen and the work was spread out so that only a few firms received more than one contract. Only the larger bridges went as a single contract, the usual procedure being to group several of the grade-crossing structures under one bid. Total number of contracts is expected to reach 80 over the whole Turnpike.

Modern Highway

The Turnpike traverses the state diagonally, cutting across ten counties without a single stop light or grade crossing on the way, and with limited-access controls. This express artery for

(*Concluded on next page*)

Prevent Costly Fires with this Flameproofed

(AND WATER PROOFED)

PROOF! BY THE BLOW TORCH TEST

First . . . an ordinary tarpaulin is subjected to the flame of a lighted torch. Almost instantly the canvas ignites, continuing to burn after the blow torch has been removed, and in a matter of seconds the tarpaulin is completely destroyed.

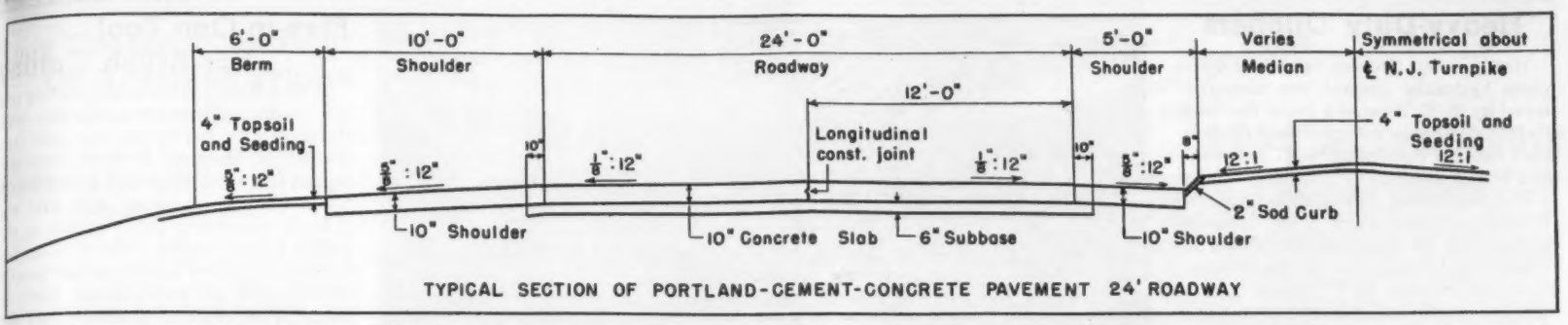
Now the torch is put point-blank to a Flame-Zel Tarpaulin. Only the section in immediate contact with the flame becomes damaged by charring. The tarp will not burst into flame and the fire will not spread. Upon removal of the torch there is no afterglow or smouldering. Flame-Zel resists fire!

Here's real fire insurance in construction tarps at prices you can afford. FlameZel, the low cost flameproofing and waterproofing finish developed in the Wenzel laboratory, does the maximum fire resistant job at the minimum cost.

Now you can prevent ruinous fires due to inflammable tarps . . . prevent costly construction delays and labor losses . . . yes, now you can leave the job knowing that your tarps won't kindle costly fires when exposed to salamanders, glowing cigarettes, sparks, hot rivets, acetylene torches, etc.
Protect your construction investment NOW!

FlameZel
Flameproofed by WenZel
TARPAULINS

H. WENZEL TENT & DUCK CO. 1035 PAUL ST.



TYPICAL SECTION OF PORTLAND-CEMENT-CONCRETE PAVEMENT 24' ROADWAY

all vehicular traffic will have 16 interchanges including the two terminals at the Delaware Memorial Bridge on the south and the George Washington Bridge on the north. The latter is at the intersection of Route 6 which ties in to the bridge over the Hudson River leading to New York City on the opposite shore. The distance from the Turnpike to the bridge is only 2 miles. A direct connection is provided to the Lincoln Tunnel which crosses under the Hudson to the vicinity of 34th Street, New York City. No special connections have been made to the already overburdened Holland Tunnel leading into lower Manhattan, although the Newark-Jersey City interchange at Raymond Boulevard, in Newark, provides ready access to roads leading to this tunnel.

Other interchanges provide connections also to the principal cities in New Jersey as well as to Philadelphia, Pa., and Wilmington, Del. The Turnpike will relieve traffic conditions on heavily congested U. S. 1 and U. S. 130 in particular, and on all routes between New Jersey beach resorts and the densely populated areas of North Jersey and New York, particularly during heavy holiday movements. Safety is emphasized, with multilane pavements flanked by wide shoulders, and with opposing traffic separated by broad median strips. Curves are slight, and long sight distances prevail.

From the southerly end to the traffic interchange with Route 35 north of the Raritan River, approximately 92 miles, the Turnpike will have four 12-foot traffic lanes—two on each side of a median strip having a minimum width of 26 feet including inner shoulders. On the outside of the dual payments there will be 16-foot shoulders with 10 feet stabilized. There will be 5-foot stabilized shoulders on the inside next to the median strip which is raised, with 12 to 1 slopes from the center to the sodded edges. Over this stretch the right-of-way is 300 feet wide.

From the Route 35 interchange near Woodbridge north to the interchange with Route 3 at the Lincoln Tunnel, about 22 miles, there will be three 12-foot lanes on each side of a median strip 20 feet wide including inner shoulders. Shoulder widths will be the same. For the remaining 4 miles to the present northerly terminus, there will be two lanes on each side of the median. Right-of-way width on this northerly end is a minimum of 250 feet, except for a few short stretches of 200-foot width in built-up areas.

Sufficient land has been acquired, however, to widen the Turnpike pavement to six lanes where the present design calls for four, and to eight lanes dual-dual where there are six. Overhead bridges are being constructed according to the ultimate plan. Major bridges are the fixed-span type, high enough to provide clearance for all navigation. Over 260 structures are required in the 118-mile route. The largest is the 7,000-foot overhead structure in the Newark-Kearney area which includes a 375-foot plate-girder span over the Passaic River. The Turnpike goes under the Pulaski Skyway in this vicinity.

Maximum grade on the superhighway is 3 per cent. In two locations horizontal curves were reduced to 3,000-foot radius, but on most curves the radii are 10,000 feet or better. While no speed limit has been fixed as yet, the design would permit speeds of from 60 to 75 miles per hour.

Different Types of Grading

From the southerly end the Turnpike roughly parallels the Delaware River past Camden and Trenton, then crosses the narrow middle of the state to the banks of the Raritan. This longer portion of the Pike runs through gently rolling, farming country that provides fairly good material for road building. Grading contracts in this area were typical cut, fill, and borrow earth-moving operations, with some sand-drain operations in Salem and Gloucester Counties. Total earthwork for the entire Turnpike amounts to 42,500,000 cubic yards.

The northerly end of the project must necessarily cut across the Jersey meadows, a low marshy waste bordering the Arthur Kill, Newark Bay, Passaic and Hackensack Rivers. Sand drains and sand-blanket technique is employed on grading contracts along this stretch to stabilize the soft soils until settlement is reached as quickly as possible so that heavy vehicular loads may be carried safely. Typical grading contracts on both upper and lower sections of the Turnpike are described in accompanying articles. George M. Brewster & Sons, Inc., of Bogota, N. J., has a contract requiring the use of sand drains, while the Grandview Construction Corp. of Mt. Vernon, N. Y., handles the more conventional type of grading.

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From these distributors

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Minnesota—Minneapolis Equipment Co., Minneapolis
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Pecaut Industrial Supply Co., Sioux City
Nebraska—Anderson Equipment Co., Omaha
South Dakota—Pecaut Industrial Supply Co., Sioux Falls
Montana—Montana Powder & Equipment Co., Helena
Western Builders Supply, Billings
Washington—Construction Equipment Co., Spokane
Oregon—Woodbury Co., Portland
California—Industrial Equipment Co., of Southern California, Los Angeles
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Utah—The Salt Lake Hardware Co., Salt Lake City
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Amazing New TARPAULIN...

Meets the fire resistant requirements of Federal Specifications CCC-D-746. Manufactured under Wenzel flameproofing Patents No. 2286744, No. 2436216, No. 2463983 and others.

FlameZel is durable—will not wash out

Federal Specifications CCC-T-191a pertaining to leaching tests call for immersing material in circulating water for 24 hours. Then after drying, material must continue to pass the fire resistant requirements of CCC-D-746. FlameZel passes this test. As further proof, FlameZel samples taken at random from production and after actual climatic exposure for a period of 19 months still passed the fire resistant requirements of CCC-D-746.

COSTS VERY LITTLE MORE THAN ORDINARY TARPAULINS

Ask your distributor (listed at the right) for low prices on FlameZel Tarps and Windbreaks. He can make immediate delivery.

Individually Packaged

FLAMEZEL TARPAULINS are individually packaged at the factory for convenience in handling, stocking and instant identification. When you buy tarpaulins, be sure you get the packaged tarp with the over-all design of the famous FLAMEZEL trade mark. It's your protection of quality.

For Weather Protection
Where Fire Is Not a Hazard

RainZel Waterproofed Tarpaulins and Windbreaks are the answer because they represent quality at its best. Ruggedly constructed and built to stand the gaff, RainZel Tarps will give lasting service and protection against the weather at low cost.

RainZel
Waterproofed by WenZel
TARPAULINS

ST. LOUIS 4, MISSOURI

Heavy-Duty Ditchers

Heavy-duty ditchers featuring complete hydraulic control are manufactured by E. V. Briscoe & Sons, Kerman, Calif. Available in 5 different models, they can cut ditches up to 17 feet wide and 5 feet deep.

The controlled movements on the Briscoe ditchers vary with different models, but they include the ability to "bank" the ditcher on its longitudinal axis, independent of the wheel. This feature enables the operator to keep the ditcher on the same cutting plane, regardless of the nature or unevenness of the bottom of the ditch. Hydraulic power is supplied by the ditcher's own gasoline engine and is said to be sufficient to assure a reserve for all conditions.

Because the ditcher has its own front wheels and is not dependent upon the tractor for front-end support, it may be pulled by tractors on one or both banks, by the use of a cable linkage. This feature is useful when vegetation or water in the ditch makes it impossible to operate the pulling tractor directly ahead of the machine. In these cases the tractor may be on either bank some distance to the side of the actual cut.

Over 500 cubic yards of earth per hour is hoisted out of a 5-foot-deep irrigation ditch by the largest model Briscoe ditcher. Note the hydraulically controlled spoil wings.

The three Model A units will provide a top ditch width of 12 feet maximum or 6 feet minimum; Model B will provide a 17-foot maximum and an 8-foot minimum; while Model C will provide the same as the B but under heavier going. Spoil wings are hydraulically controlled extensions to the moldboard that serve a dual purpose of increasing the total ditch depth possible and forming a flat top on the spoil bank.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 230.

Buda Merchandise Manager

E. R. Galvin is now Merchandise Manager of The Buda Co., Harvey, Ill., manufacturer of diesel and gasoline engines. He has been successively General Sales Manager of Caterpillar Tractor Co., R. G. LeTourneau, Inc., and LaPlant-Choate Mfg. Co. In his new position he will supervise retail sales through the Buda distributing organization.

Five-in-One Tool For Brush Cutting

A new five-in-one brush-cutting tool for road maintenance crews has been developed by the Sythax Co., 445 Tennessee St., Memphis 3, Tenn. It is designed to do the work of a scythe, brush hook, hoe, weed cutter, and axe, and it looks something like a scythe on the end of a long handle. The oval-shaped handle is made of hardwood and is supported with an extra-heavy piece of steel. The blade is double-edged and is made of 16-gage tool steel, 11½ inches long and 3½ inches wide. The cutting edge may be resharpened without removing it from the handle.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 250.

Folder on Utility Hoist

A 4-page circular describing the American Model 500 utility hoist is offered by the American Hoist & Derrick Co., St. Paul 1, Minn. This unit, when provided with the standard gearing, offers a 500-pound single-line pull at 200 feet per minute, with 100 feet of ¾-inch manila rope on the drum. The literature points out that other gearings are available to provide a lighter or stronger pull at faster or slower speeds. The utility hoist weighs 400 pounds and can be transported from one job to another on its own frame, which is provided with steel wheels mounted at one end and handles at the opposite end. The folder illustrates the unit in operation and gives complete specifications.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 175.

WHEN BUYING A VIBRATOR

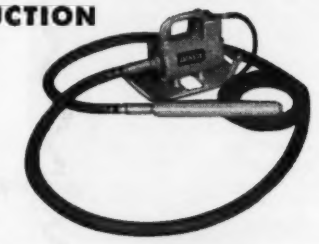
It Pays to Insist on a JACKSON

Jackson vibrators are the products of more than 27 years of specialization in this field, and are offered in a wide range of models to give you the vibrator that exactly suits your particular needs on every type of construction . . . the one that will give you the greatest savings in time, labor and money; plus UNMATCHED DEPENDABILITY.

FOR GENERAL CONSTRUCTION

THE POWERFUL, Handy JACKSON ELECTRIC

2½ HP Motor. Powerful enough to handle the stiffest mixes with maximum length of shaft (28'). Operates from light-socket; 115 volt, single phase AC or DC. 8,000 to 10,000 VPM. Weighs only 50 lbs. Available with three vibrator heads for thin or thick sections. Model No. FS-150A.

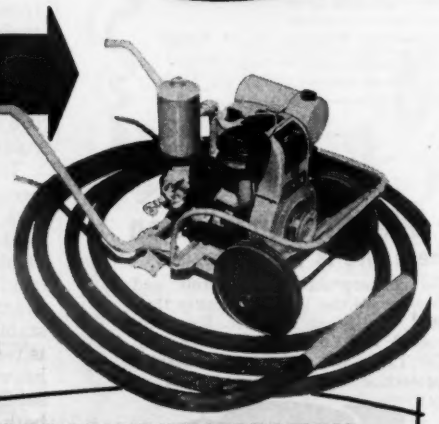


THE ACE OF ENGINE-DRIVEN FLEXIBLE-SHAFT VIBRATORS

Proved on countless jobs the finest of its class. 4.7 HP engine — plenty of power under all conditions. Available with 3 heads for thick or thin sections and shafting in 7' and 14' lengths up to 28'. Instantly variable frequency up to 7500 VPM. Quickly converted to grinding and drilling. Model FS-6A.

THE HYDRAULIC with the TIME-SAVING 50' REACH

the hard-to-reach spots are easily accessible with this machine and much time is saved by eliminating changes of power unit location. All moving parts run in oil under pressure—no maintenance required. 7 HP engine and 2¾" head assures perfect compaction under most severe conditions. 4,000 to 7,000 VPM — instantly variable. The finest vibrator of its type money will buy.



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from thin sections to mass construction and paving you will find the ideal Jackson Vibrator FOR SALE or FOR RENT at your Jackson Distributor. Write for your free copy of the "POCKET GUIDE" describing the complete line.

ELECTRIC TAMPER & EQUIPMENT COMPANY
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8000 lbs. Line Pull— 400 f.p.m. Line Speed!

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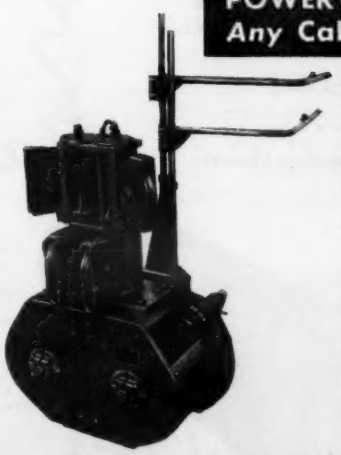
POWER CONTROL UNITS Will Meet Any Cable Control Requirements



For bulldozing, scraping, rooting, earth moving, light logging, or for any kind of cable control work, there is a Kay-Brunner Power Control Unit to fit the job. Line pulls from 5000 to 9500 lbs., line speeds from 250 to 400 f.p.m., and gear ratios from 5-1 to 12-1 give the tractor operator ample power, fast response and precise control for his work.

Alloy, heat-treated, cast steel cases and covers; alloy steel gears, cone-type clutch, swinging fairleads and easy field servicing assure long life, dependable action, versatility and easy maintenance.

There is a Kay-Brunner Power Control Unit for *your* tractor—for *your* job. Write for Bulletin 364-ED.

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POWER CONTROL UNITS • LAND LEVELERS • DOZERS AND TRAIL BUILDERS • RIPPERS • CARRYING SCRAPERS • TAMPING ROLLERS • HYDRAULIC CONTROL SYSTEMS

Long Grading Contract On Turnpike Project

(*Continued from page 20*)

requiring ditching to be done first before grading could start.

Five Million Yards

Cuts and fills balanced out fairly well, only four major borrow pits being required to round out the highway embankments. Pits were located close to the Turnpike, and yielded good sandy-gravel material. The Turnpike Authority acquired these sites for the contractor, who was required to shape them up and leave them in good condition when he was finished. The deepest cut was 20 feet where a hill was leveled, and the highest fill was 80 feet for the Raritan River bridge approach at the northerly end of the job. At this spot from 18 to 20 feet of muck was first removed by dredging before backfill was placed by end-dumping out from the bank.

Over 5,000,000 yards of earth-moving was involved, including 3,400,000 yards of roadway excavation; 1,500,000 yards of borrow; and a separate 190,000-yard item for muck removal. Another major item in the contract was the 40,000 linear feet of concrete drainage pipe, 10 to 72 inches in diameter.

Engineering and supervision of construction of Section 4 is handled by the consulting engineering firm of De Leuw, Cather & Co. of Chicago, Ill., which set up field headquarters in Hightstown, N. J. Grandview established its offices and shop north of Hightstown on Prospect Plains Road, just about midway of the contract. Construction got under way near the end of March, 1950, and is scheduled for completion by the end of this month.

Impressive Fleet of Equipment

For the long hauls, averaging 3,500 feet, the contractor used rubber-tired earth-moving equipment that included 7 Super C Tournapulls, 5 LaPlant-Choate motor scrapers, 36 bottom-dump Euclids, and 6 end-dump Euclids. The Euclids were loaded by two Euclid loaders and a pair of Northwest 80-D 2½-yard shovels. For the shorter hauls, averaging 800 feet, tractor-scraper units were employed. Of the 23 scrapers on this work, 9 were LeTourneau, 4 Gar Wood, 7 LaPlant-Choate, 2 Caterpillar, and 1 Bucyrus-Erie.

A total of 50 tractors were kept busy either as dozers on the fills, opening up the cuts, hauling the scraper units, or serving as pushers in the loading, or pulling the various rollers. They included 24 Allis-Chalmers HD-19's and 4 HD-14's; 14 Caterpillar D8's, 5 D7's, 1 D4, and 1 D6 Traxcavator; and 1 International TD-24.

Fills were spread in 6-inch lifts and compacted to 90 per cent modified Proctor by rollers that included a Buffalo-Springfield 3-wheel 10-ton roller; 5 sheepsfoots—4 LeTourneau and 1 Trojan; and 3 Bros rubber-tire rollers—2 at 10 tons and 1 at 50 tons. The latter, pulled by an HD-14, is a Straight-Wheel Giant pneumatic-tired Model 6 roller with four 18.00 x 24 rear tires. Because of the normally moist material, little water was added during the placing of the embankment, but 3 tank trucks were available—2 at 1,500-gallon capacity and 1 holding 750 gallons. Final shaping was done by four motor graders—2 Caterpillars and 2 Austin-Westerns.

Drainage work was handled with four Bay City excavators—two ¾-yard 45's, a 1¼-yard 65, and a ¾-yard truck crane.

Extra Compaction

The upper 3 feet 4 inches of the sub-

(*Concluded on next page*)

Garrison

HYDRAULIC POWER STEERING BOOSTER INSTALLED ON ALLIS-CHALMERS AD-4 MOTOR-GRADER

Available in kits for AD-3, AD-4, BD-2 and BD-3 Motor Graders

• Reduces steering effort to easy one-hand operation. • Wheel fight and road shock eliminated.
• Mechanical steering in effect with hydraulic assistance. • Easily installed in the field.

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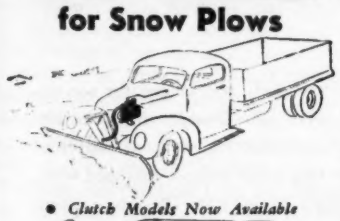
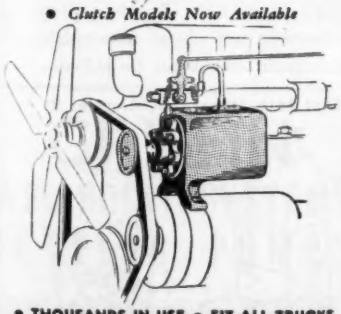
POWER HYDRAULICS for Snow Plows



• *Clutch Models Now Available*



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• FAN BELT OR ELECTRICALLY DRIVEN MODELS
• *Write Hydraulic Division*
MONARCH ROAD MACH. CO.
323 North Front Ave., Grand Rapids 4, Michigan

SUPERIOR

Regular and Cone-Fast COIL TIES

Two types to meet varying job conditions on form work for bridge piers and abutments, retaining walls, filtration and sewage disposal plants, and other engineering projects.

Your form erection crews can maintain fast erection schedules when using Superior Regular or Cone-Fast Coil Ties because simplicity is built-in. Helix coils, electrically welded to the longitudinal wires, receive the Coil Bolts with coarse thread that are easy to apply.

Superior Coil Ties, performing both as tie and spreader, are available in two basic types to meet varying job conditions:

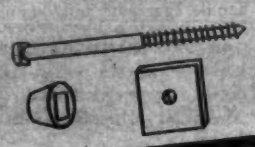
REGULAR COIL TIES are used with Spreader Cones when specifications require the tie metal to be 1″ or 2″ back of the wall face.

CONE-FAST COIL TIES. Exclusive feature is extension of the coil beyond the ends of the wire struts to hold the reamed cone snugly in position before the opposing panel is erected. Recommended where large panels are used for walls that do not permit a man inside the forms.

Both types are made for Coil Bolts ½″ to 1¼″ in diameter with safe working loads from 5,000 to 36,000 pounds and can be used with wood, combination wood and steel, and all steel forms.

Preplan your form work and cut costs by getting maximum use from your form panels. Our engineering department will help you on special problems.

EXCLUSIVE CONE-FAST FEATURE
Reamed coil cone fits over projecting coil end . . .



ECONOMICAL . . . these working parts returnable for full credit. Only coil tie is expendable.

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REQUEST a copy of our 56-page catalog. It contains a valuable table for spacing studs, wales and form ties.

Long Grading Contract On Turnpike Project

(*Continued from preceding page*)

grade is compacted to 95 per cent maximum density according to modified Proctor. Of this depth the bottom 12 inches was regular fill material with no special specification requirements. The next 12 inches, known as Type B subgrade, is graded so that not more than 10 per cent passes a 200-mesh sieve; it has a California bearing ratio (CBR) of 15 minimum, and a plasticity index of 6 maximum. The upper 1 foot 4 inches is Type A subgrade, a frost-resistant, pervious, free-draining material, graded so that not more than 6 per cent passes a 200-mesh sieve; it has a CBR of 20 minimum, and a plasticity index of 3 maximum.

Radiotelephones

Construction operations were carried on over all parts of this 24½-mile contract at the same time, and considerable jumping about was required with men and equipment, since the entire right-of-way had not been acquired at the start of the work. The alignment, of course, was all new location, and difficulty was often experienced in reaching parts of the project over the little-known back roads. Then, too, the section was cut up pretty well with the various bridge structures being built.

To keep in constant touch with his far-flung staff, the contractor installed a Link frequency-modulated radio transmitter-receiver system. Nine transmitter-receivers for key personnel were placed in Jeeps or cars, with the main station at headquarters near the center of the job. Communication was thus maintained over the entire contract at all times. The central office consisted of four trailers, laid out in the form of a cross, and open at the junction for easy passage from one to another. At the center was the 35-foot radio tower.

Altogether 14 trailers—Fruehauf and Keystone—were brought to the job for use either as offices or storerooms for equipment parts. Calso fuel for the equipment was also stored at headquarters in a 10,000-gallon diesel tank and a 5,000-gallon gasoline tank. Two 4,000-gallon tank trucks and one 4,000-gallon trailer tank delivered the fuel to the equipment out on the job.

The Grandview Construction Corp. worked a single 10-hour shift, 6 days a week, and employed an average force of 200 men. With the equipment fleet listed above, an average of 30,000 cubic yards of dirt was moved in a 10-hour day.

Personnel

Contractor personnel included Jim Mirabelli, Project Manager, with his brother Dominick Mirabelli, the General Superintendent. Robert Sheehy is Office Manager, and Pat DeRosa, Field Engineer. Ernest Young is Superintendent on the lower half of the contract, and M. J. Brown on the upper half.

For De Leuw, Cather & Co., R. B. Richards is Project Manager; Quigley Fletcher, Project Engineer; and Jim Ritchie, Assistant Project Engineer. F. Bosworth is Resident Engineer on the lower half of the job, and Fred Simpson on the upper half.

Snow Loader Described

A 4-page folder on the B-G Model 548-A hydraulically controlled snow loader has been prepared by the Barber-Greene Co., Aurora, Ill. A photograph on the center fold illustrates the principal features of the loader and shows it in operation. Condensed specifications are included.

This literature may be obtained from the company, or by using the Request Card bound in at page 16. Circle No. 159.

A Symposium on the Use Of Pozzolanic Materials

Papers and discussions which made up a symposium on the use of pozzolanic materials in mortars and concretes, presented at the First Pacific Area National Meeting of the American Society for Testing Materials, in San Francisco, October, 1949, have been collected by the ASTM in its Special Technical Publication No. 99.

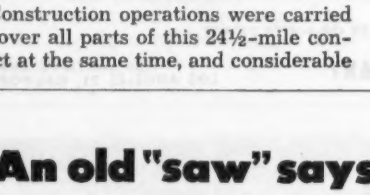
The papers present a complete picture of research findings on the use of pozzolanic materials. The book begins with a historical review of the early use of pozzolans and continues with discussions of the use of pozzolans in mass concrete; experience with Kansas aggregates and pozzolanic additions; the effect of calcination on natural pozzolans; the effect of the use of diatomite treated with air-entraining agents upon the properties of concrete; a summary of methods of determining pozzolanic activity; and a chapter on the strength, volume, change, and sulfate resistance of mortars containing portland-pozzolan cements. Two papers on the use of pozzolans for counteracting the excessive concrete expansion resulting from a reaction between aggregates and alkalies in cement conclude the book.

Special Technical Publication No. 99 may be obtained from the American Society for Testing Materials, 1916 Race St., Philadelphia, Pa. The price is $2.50.

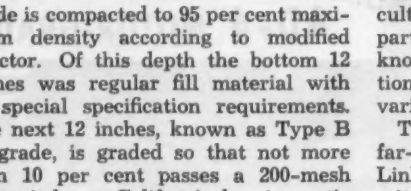
Hose and Fittings Sales

The Weatherhead Co., Cleveland, Ohio, has created an Industrial Sales Division to handle its line of hose and fittings. A. D. Hodge, Sales Manager, will direct the division's sales and service program.

An old "saw" says TIME IS MONEY



A new saw SAVES YOU BOTH!



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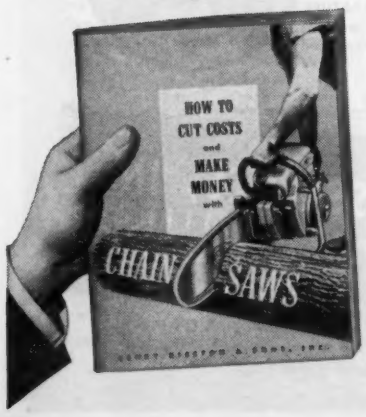

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Disston DO-100 One-Man Chain Saws take the woe out of work... save time, increase production, enable you to make more money. With this lightweight 3½ hp saw, you can fell a 20-inch tree in a matter of seconds.

A Maine logger says:

"I had one of the first DO-100's that came into Maine. I've also used the Disston Two-Man for three years. They're both far ahead of any other saw I've seen. They can't be beat!"

A West Coast owner says:

"I just cut 10 ricks of 14-inch wood in 3½ hours with a DO-100. This is the best machine on the market. Show me any other make rugged and dependable enough to do the same!"

You don't have to take the experts' word for it. Try a One-Man Disston yourself. Sample that easy heft. The balance that makes the DO-100 a pleasure to work with, makes it a pleasure to carry, too.

Then try it on some big ones. There's not a cutting job it won't do—right side up, upside down, on either side, at any angle. Cutting capacities range from 15 to 30 inches, but even big trees can be handled safely by rotating the saw. Guide rails are interchangeable in the field.

Find out how Disston Chain Saws can make money for you. Send for this big, 36-page, picture-packed, fact-loaded book. Get your free copy by mailing the coupon today. Then go to your Disston Dealer and let him demonstrate one of these famous saws for you.

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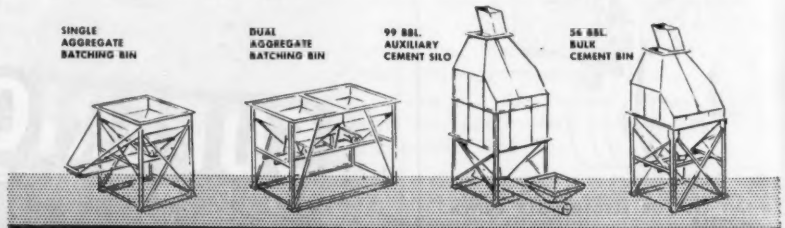

ASSEMBLE IN ANY COMBINATION

The General steam cleaner operates on kerosene, No. 1 or 2 fuel oil, light diesel oil, or on crankcase, transmission, and rear axle drainings. Full operating pressure is generated in 90 seconds.

Vapor Steam Cleaner Said to Use Any Fuel

A new heavy-duty vapor steam-cleaning machine has been announced by the General Equipment Division of Sterod Mfg. Co., 444 Frelinghuysen Ave., Newark 5, N. J.

According to the manufacturer, full operating pressure is generated within 90 seconds. The entire system is automatically protected from excessive pressures at three independent points. A mechanical outside safety valve is provided as a check on the electrical limit switch and by-pass valve. Heating coils are protected by a special control which stops the entire unit should the water supply fail or become inadequate. And the entire electrical system is protected by an overload switch.

No premixing of the cleaning compound is necessary with the General. From the point at which the dry compound is placed in its tank until it emerges as a supersaturated jet of steam from the gun, the whole mixing operation is fully automatic. The required amount of hot water is fed into the compound tank to insure proper dissolving. This solution is then fed into the steam stream in the desired strength as selected by the metering valve on the instrument panel—but not until after the steam leaves the heating coils. In this way the heating coils are protected against partial clogging or obstruction.

The specially designed burner for the cleaner will operate on kerosene, No. 1 and No. 2 fuel oil, light diesel oil, or on crankcase, transmission, and rear axle drainings without adjustments of any kind, the company claims.

The General is available in stationary or portable models of 100 or 200-gallon capacities. It is supplied with a multipurpose swivel type of cleaning gun with gun-control shutoff. The steam can be shut off for an unlimited time without stalling the unit. With the removable swivel-front section, any of the alternate attachments can be connected without stopping the motor. These attachments include the Aqua-Jet gun for special compounds such as paint strippers or special cleaners or for short runs; and the Radi-Flush for cleaning and reverse flushing of clogged automobile, truck, tractor and other engine radiators. A full-bearing ½ or ¾-hp motor powers the unit.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 219.

Dragline Bucket Catalog

"No matter what your dragline problem may be, there is an Omaha bucket that will do the job", says Drake-Williams-Mount Co., Omaha, Nebr., in its new 12-page catalog. The literature illustrates Omaha buckets on a variety of jobs and gives detailed information and specifications on the Omaha LCR (levee, cleanout, rehandling), featherweight, standard, and heavy-duty buckets. The buckets are available with capacities ranging from ¼ to 14 cubic yards.

LCR buckets are regularly furnished with perforations in the sides and back, designed to increase the payload by leaving water in the pit and releasing any vacuum created by wet material in dumping. They may, however, be obtained without perforations. The folder outlines all the features of the body plates, runners, reinforcements, and fittings. It points out that rigid-type sheaves may be obtained at no additional cost, and that manganese chains are available in place of the steel as an extra.

The catalog includes complete specifications for all models up to the 4-yard-capacity ones. Spex on larger sizes may be obtained from distributors or the manufacturer.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 114.

U. S. Rubber Branch

A warehouse and office building for U. S. Rubber Co. at 900 S. Jefferson Davis Parkway in New Orleans, La., will be ready for occupancy about January 1. The building will be headquarters for the distribution of products in all of Louisiana as well as parts of Alabama, Florida, and Mississippi.

The Original and Only

"More Power Puller"

A compact, light weight hand-operated tool for heavy duty use, will cut operation cost, both time and labor. Unexcelled for construction use, moving machinery, handling equipment, rigging, pulling stumps, laying pipe lines and many other uses. Ask your local Dealer for demonstration.

Equipped with 20, 30 & 40 ft. of cable
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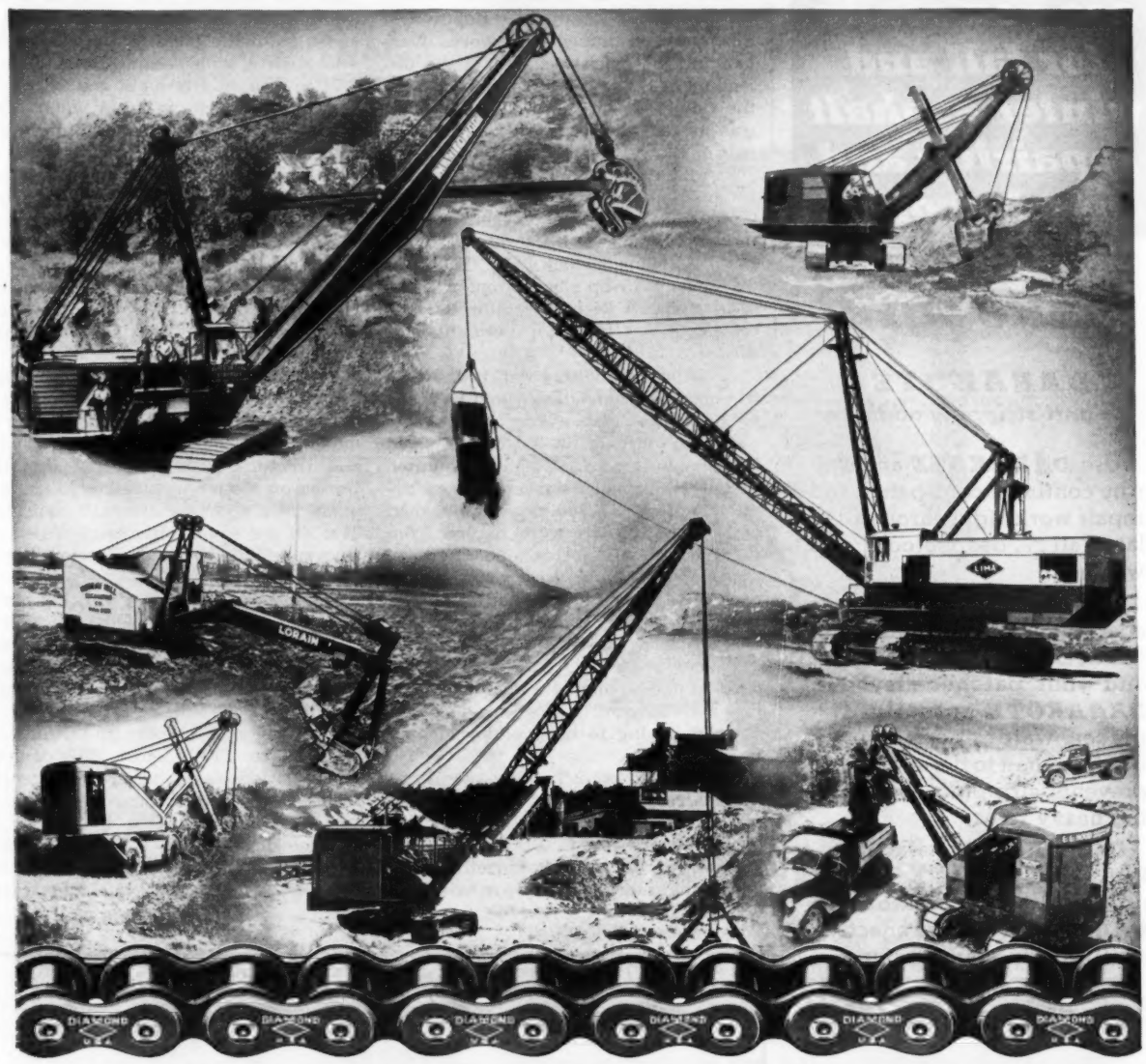

Wherever Construction Machinery Is Used Diamond Roller Chains Are First Choice

● For their modern construction and road machinery, used on all kinds of jobs and in all kinds of weather, operators demand long-life dependability.

Throughout the rapid advance in construction machinery design during the past 30 years or more, much of the higher efficiency and output—and the long-life dependability—can be attributed to the increasing use of Diamond Roller Chains. They transfer power from engine to main shaft and from there to countershafts without slip or creep—they withstand shocks and long hour service with minimum attention.

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GRIFFIN WELLPOINT CORP.
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TEL. ME. 5-7704

Sand Drains Stabilize Fills Over N.J. Meadows

(*Continued from page 21*)

sured quick settlement so that heavy loads might be carried without long delays.

Borrow by Rail

The contractor placed the Zone 1 sand blanket to a depth of 4 feet over the full width of the roadway. This blanket was also extended out 10 feet beyond the toe of slope so that the entire fill might receive full support, and to allow the water coming from the sand drains to reach the existing meadow. Pervious material was required in the blanket so that water could percolate through the layer. The problem of obtaining suitable material in a section of the state where good borrow is difficult to find was solved with the discovery of a 2,500,000-cubic-yard stockpile of mine tailings at the Allenwood iron-ore mine at Mine Hill, N. J., near the city of Dover. The tailings had been accumulating there for the last fifty years, with little use being made of them.

C. & E. M. Photo

Snapped on the sand-drain contract—a battery of 4 Le Roi 500 air compressors mounted on a low-bed Fruehauf trailer. This portable outfit was handy to shift about on the sand-drain job.

Brewster arranged to take over the stockpile, put a railroad siding in to the mine tipple, and load the fine granulated tailings into hopper-bottom cars. The material was shipped 40 miles to a siding of the Delaware, Lackawanna & Western Railroad in Secaucus. There the contractor set up two Robins Car Shakeouts on timber frameworks overhanging the track to facilitate the unloading of the tailings into pits beneath the siding. From the pits the material was moved on two conveyors up to a pair of Blaw-Knox hopper bins holding 300 tons each. One conveyor was a Robins while the other was a Barber-Greene, 162 and 180 feet long respectively. Both were equipped with Hewitt-Robins 30-inch belts. Each was driven by a 75-hp electric motor set up on the bin. A 24-inch reinforced-concrete mat was laid as a foundation for the bins.

Each hopper-bottom car held about 60 cubic yards of tailings, and with the two conveyors, an average of 96 cars were unloaded in an 8-hour shift. In the two-shift work day this amounted to 11,520 yards of material. The maximum output was 106 cars unloaded in one shift. Tailings were hauled from the bins to the project in a fleet averaging 40 trucks, some contractor-owned and some hired. The haul distance ranged from 3½ to 6½ miles, and the average load carried was 13½ yards. The bins were laid out so that the trucks made a complete loop on entering and leaving the siding location, without having to back under to pick up a load.

For this and other hauling operations the contractor employed a fleet of 140 trucks of which 60 were his own and the rest were hired. Brewster trucks were Macks with 14-yard Heil bodies, while the hired units were assorted makes holding at least 10 yards.

Working Platform

Zone 1 material was end-dumped and dozed out over the meadows through which it gradually sank into the water. After a 4-foot layer was built up, Zone 2 material was added as the second step in making the fill. This was a nonplastic material obtained from a pit at Delawanna near the Passaic River about 8 miles from the job site. It was bank-run quality, with nothing larger than 2 feet in size, and brought the fill up to elevation plus 6.0, mean low water. The thickness of this layer varied, for on the unstable terrain Zone 2 material was placed as necessary to bring the surface to the required elevation, and so included settlement which occurred during placement of both the Zone 1 and 2 materials. In addition, Zone 2 was carried above the specified grade sufficiently to allow for settlement which would occur when the remaining fill was placed.

Obviously no compaction was required with Zone 1, but Zone 2 material got a good pounding from the dirt-moving equipment—the hauling trucks and tractor-dozers spreading the fill. Dozers on the job included eight Caterpillar D8's and two International TD-24's. Of the shovels, five were 2½-yard Bucyrus-Erie 54-B's, and one was a 2-yard 820 Lorain.

With Zone 2 in place, a working platform or table was provided from which to install the sand drains. On the lower end of the job, south of Route 3, where the marsh is deeper, the water did not flow out to the sides through Zone 1 fast enough, but came on up through to the surface. To remove this water, gravel windrows similar to french drains were placed transversely across the roadway at 40-foot intervals. A backhoe dug a ditch, 1 to 2 feet wide, through Zone 2 down to Zone 1. After being backfilled with gravel, the ditch drained off the water that had accumulated on the working platform.

Sand Drains

From this platform sand drains were installed on from 6 to 14-foot centers both ways over the roadway. The spacing varied with the loading conditions. The drains are 14 to 20 inches in diameter, and from 6 to 100 feet in depth, according to the location for which they were designed. They drain the water out of the muck as the weight on top is pressed down. The water flows up through the sand drains, then out to the side of the roadway through the horizontal sand blanket which gradually settled as the muck dried out. Draining continues until the fill is fully settled or stabilized, while the embankment goes up higher.

Six rigs were used on the sand-drain work, including two Manitowoc 3500 Speedcranes, three 54-B Bucyrus-Eries, and a Koehring 1005. They were equipped with booms 70 to 80 feet long.

(*Continued on next page*)

are you ready for fall and winter asphalt repairing and patch-work?

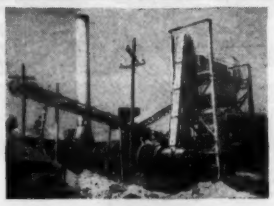
make sure!

use **DARAKOTE**
anti-stripping additive

Use ***DARAKOTE*** and you can continue cold-patch and repair work right through the late Fall . . . despite cold, wet weather.

With ***DARAKOTE,*** you can coat cold, wet aggregates with cut-backs and road oils . . . . and your patches stay put. ***DARAKOTE*** actually displaces water, permanently binds asphalt to the aggregate, prevents stripping even during heavy rains.

DARAKOTE retains its effectiveness under heat, will not settle out in storage. ***DARAKOTE*** is more effective at all working temperatures.

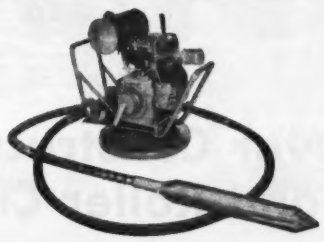


DARAKOTE AT WORK

Asphalt paving plant of Essex Sand & Gravel Co., West Peabody, Mass., preparing ***DARAKOTE*** *plant-mix for resurfacing section of Route No. 28, Andover, Mass.*

Dewey and Almy Chemical Company

Cambridge 40, Mass. Chicago 38
San Leandro, Calif. Montreal 32



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which have made them highly successful all over the world.

DEPENDABLE FLEXIBLE DRIVE. All sections interchangeable, in multiples of 7′ and 12′ lengths. No special sections required. Each casing has ball-bearing connector. Each alloy steel core has slip joint which does not separate. It prevents stretching and overheating. No limit to length of drive.

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Use the Economical SMITH 105-P Compressor

The new Smith 105-P will handle the majority of your compressor jobs, for less. Powered with Chrysler's newest and largest Industrial engine—Ind. 15, six cylinders, 4" bore, 5" stroke, 377 cu. in., 3" crankshaft, 7 main bearings, sodium cooled valves and Stellite valve seats for extra heavy duty and long life. Compressor valves are stainless steel disc type with Manganese Bronze seats. Delivers 105 cubic feet per minute. Equipped with improved type-pilot valve and simplified control for efficient, long life with minimum attention.

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Also write for information on
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MODEL 70-P COMPRESSOR

SMITH Air Compressors

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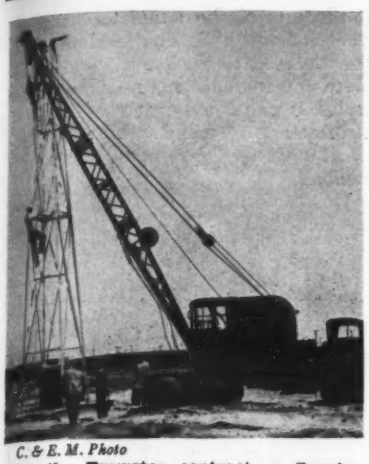

C. & E. M. Photo
On the Brewster contract, a Lorain Moto-Crane erects a 40-foot steel tower for a Universal light plant which will light four 1,000-watt bulbs.

steel leads up to 124 feet high, McKiernan-Terry 1½-yard sand skips, and McKiernan-Terry hammers — usually 10-B-3 or 11-B-3. The rigs drove steel mandrels or cores, 50 to 100 feet long, into the ground. The mandrels were the same size as the desired diameter of the drain, and were closed at the bottom with a steel flap that remained shut during the driving. The hammers were operated by compressed air pumped into receivers. Compressors included 14 units—Le Roi, Gardner-Denver, and Ingersoll-Rand—all rated at 500 cfm. They were usually assembled in groups. Two portable outfits that were handily shifted about consisted of a battery of four Le Roi 500-cfm compressors mounted on a low-bed Fruehauf trailer which also carried an air receiver along one side.

The mandrels were generally driven to solid foundation, but in some cases no bottom was reached even with a 100-foot length made up of two 50-foot sections. In the meantime, sand for the drains had been stockpiled over the fill. This sand had come by barge from Gallagher's pit at Northport, Long Island, N. Y., to a wharf on the Hackensack River, and was trucked from there to the job. Four Hough Payloaders with 1-yard buckets served the rigs, scooping up the sand and depositing it in the sand skips. The skips were raised up the leads, and the sand emptied into the mandrel which was filled when it reached its maximum depth. Then the lid was closed, and compressed air forced into the mandrel as it was pulled from the ground. The hinged bottom plate on the mandrel permitted the sand to flow into the hole, and the compressed air insured complete ejection of the sand as the pipe was withdrawn. Thus the hole was completely filled with sand, and the muck was kept out of the drain.

During the driving, a hickory block was set on top of the mandrel to absorb the blows, and to lessen damage to the core itself. This sand-drain technique has been tried on three other New Jersey highway projects. (See C. & E. M., August, 1950, p. 46.) It is used in preference to the older method of construction through marsh or meadow where all the muck is excavated and replaced with suitable backfill, obviously at great cost and requiring much more time.

Completing the Fills

With the sand drains functioning, Zone 3 material was next placed on the fill to within 4 feet of the finished grade. In low areas of embankments this step was omitted. Material was obtained from the Delawanna pit, or from a pit at Paramus, about 14 miles north of the project.

On top of Zone 3 went the 4-foot thickness of Zone 4—a granular material to serve as a subbase for the pavement. Actually Zone 4 was placed above the intended grade line to allow for any settlement. This material came from the pits already mentioned, from suitable soil in the roadway cut, or from the mine tailings. Zone 5, a surcharge or overload, was added next in layers from 3 to 10 feet, the greater amount being placed in high fill areas at bridge sites

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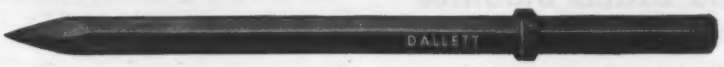

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CLECO AIR TOOLS — DALLETT

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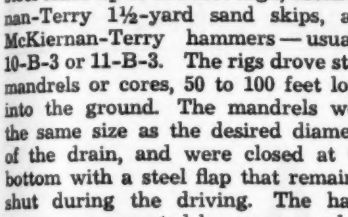

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Prevent Double Trouble
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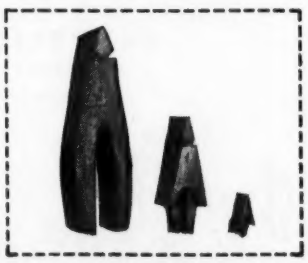
the fast, low-cost way to get worn teeth back in service!

1. Worn tooth . . . 2. Plus AMSCO Tooth Repointer . . . 3. Equals like-new tooth—ready for service!

AMSCO® tooth repointers



AMSCO Repointer Bars

3 teeth partially rebuilt with AMSCO Repointer Bars to show sectional view of welding method. These Repointer, or Wedge Bars, are also made in many shapes and sizes. Apply AMSCO Economy Hardface to the rebuilt tooth *—for as much as 3 times longer service!*

● Here's a typical example of a badly worn dipper tooth completely restored to service . . . simply by welding on the AMSCO Cast-To-Size Tooth Repointer. The result is like-new service life and efficiency, plus a long-wearing tooth of Manganese Steel—the steel that actually work-hardens in service. Cost? *Far less than replacement!*

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Sand Drains Stabilize Fills Over N.J. Meadows

(*Continued from preceding page*)

to speed compaction and stabilization. This material also came from the local pits. All Zone 5 will be removed by the paving contractor by dozing it off the sides onto the slopes.

Zone 3 and 4 material was placed in 6-inch lifts, with Zone 3 compacted to 90 per cent of modified Proctor and Zone 4 to 95 per cent. Dozers and two Caterpillar No. 12 motor graders shaped the embankments, which were compacted by LeTourneau sheepsfoot rollers exerting a pressure of 500 psi and a Super Compactor, Model 100, pulled by a D8. The Super Compactor has a total weight of 62 tons carried on its four 18.00 x 33 rubber tires. Usually the material was wet enough when placed to avoid additional watering from the tank trucks.

During the placing of the fill its stability was carefully watched by means of displacement stakes along the embankment, and pore pressure gages that went down through the various layers into the underlying soil. If the pore water pressure suddenly increased, filling operations were suspended until the pressure dropped. These pressure-measuring devices were installed at regular intervals along the roadway. A pair of Lorain Moto-Cranes handled the driving and did general utility work.

Two Shifts

In this grading contract, the top of the roadway was shaped with 1 per cent slopes from the center line to the edges; sideslopes are 2 to 1 for fills, more than 10 feet high and 4 to 1 for lesser heights. To complete the approximately 3,000,000 yards of borrow excavation, the contractor worked two shifts: 6 a. m. to 2:30 p. m. and 3:30 p. m. to 12 midnight. Illumination for the late shift was provided with 12 Universal light plants set up on skids with 40-foot steel towers on which were mounted from four to six 1,000-watt light bulbs. Equipment was fueled and greased in the hour between shifts, with any repairs being done in the contractor's main shop at nearby Bogota.

The six shovels on the job handled an average of 2,500 yards each per shift, totaling up to 30,000 yards of dirt moved each day by the huge fleet of trucks. Hauling units moved at a steady clip, their speed increasing somewhat when the drivers reached the stretch of odoriferous pig farms bordering Secaucus. Total personnel, including truck drivers, averaged between 400 and 500 men.

Quantities and Personnel

Major items on the 4.5-mile Turnpike contract included:

Roadway excavation	471,100 cu. yds.
Borrow excavation	2,875,000 cu. yds.
Vertical sand drains, 6 to 100 feet deep	1,507,000 lin. ft.
Channel excavation	151,240 cu. yds.

Key personnel for George M. Brewster & Sons, Inc., included J. F. Gibison, General Superintendent; J. P. Dennebaum, Resident Engineer; and Walter D'Anci, Foreman at the car-unloading plant.

Engineering and supervision of construction on the highway features of Section 7 was handled by the consultants: Edwards & Kelcey, Frederic R. Harris, Inc., and O. J. Porter & Co. J. E. Cowles, Resident Engineer, represented the firms on Contract 18. The Chief Engineer for the Authority is Charles M. Noble and the general consultants are Howard, Needles, Tammen & Bergendorf. General headquarters are in Newark, with a field office set up in a Cooper building midway along the project.

For Aggregate Transfer

The Diamond line of portable and stationary belt conveyors, conveyor rolls, and bucket elevators is illustrated in the new equipment bulletin, D-48-E, prepared by Diamond Iron Works, Inc., Minneapolis 11, Minn. Illustrations in the catalog show this equipment being used for a wide variety of aggregate-transfer jobs. Complete dimensions, specifications, and features are given.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 164.

Lettering Made Easy

"Perfect lettering with speed and ease" is the claim for Leroy lettering and symbol-drawing equipment as outlined in a new 20-page catalog issued by its manufacturer, Keuffel & Esser Co., Hoboken, N. J. The folder points out that Leroy lettering is "controlled"; a rigid scriber holds the pen in exact alignment and insures accurate reproduction of the template characters. The booklet illustrates and describes the Leroy lettering sets, giving complete information on sizes and letter styles. It points out that templates may be obtained for map, geological, electrical, welding, mathematical and other symbols.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 232.

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The most popular wheelbarrow on the market for handling wet concrete. Ask your dealer or write direct to Lansing or one of our warehouses.

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A Better Bond for Concrete Jobs

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● The reason: higher and more closely spaced lugs or deformations designed to exceed "Minimum Requirements for the Deformations of Deformed Steel Bars for Concrete Reinforcement"—ASTM Specification A-305-49, adopted June, 1949—the first standard specification to define surface deformations.

Thus you are assured of greatly improved bonding properties and reinforcement anchorage. You may be able to save steel—to cut bending and installation costs.

Republic's Diamond Design Concrete Reinforcing Bars are rolled from new billet steel only—at Cleveland, Buffalo, South Chicago and Gadsden. Check the table below for foot weights and new size designations. Write us for further data.

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Size Number	Cross-Sectional Area, sq. in.	Nominal Diameter, in.	Foot Weight, lbs.
3	0.11	0.375	.376
4	0.20	0.500	.668
5	0.31	0.625	1.043
6	0.44	0.750	1.502
7	0.60	0.875	2.044
8	0.79	1.000	2.670
9	1.00	1.128	3.400
10	1.27	1.270	4.303
11	1.56	1.410	5.313

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CUSENBARY SALES CO.
CUNNINGHAM - - KANSAS

Cleats on this Goodrich traction-grip tire for passenger cars act as lugs to penetrate snow and mud.

Traction-Grip Tire Now Made for Autos

A new tire specially designed for winter service on passenger cars, in snow or mud, is announced by The B. F. Goodrich Co., Akron, Ohio. Contractors and highway-department men may now put the "earthmover-type" tires on their passenger vehicles where road travel is difficult.

The new tires stopped a test car up to 40 per cent faster on ice and 64 per cent quicker on snow than standard tires with conventional highway treads, according to Goodrich; they give up to 20 per cent more traction on ice, and up to 25 per cent more on snow. With a radically different tread, cleats of the tire act as lugs to penetrate snow and mud and to give windshield-wiper action on ice, packed snow, and wet pavement. The tire runs quietly on paved highways, the company says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 184.

Data on Steam Generators

New literature on heat generators designed for low-cost automatic heating and steam production has been prepared by the Cyclotherm Corp., Oswego, N. Y. The literature offered includes a bulletin broadly describing the entire line of generators produced by the company and detailing the features of the cyclonic principle. Individual circulars present characteristics, specifications, steam capacities, and ratings for individual models.

Cyclotherm generators are available in models ranging from 10 to 400 hp with an output ranging from 335,000 to 13,400,000 Btu's per hour. The literature points out that they have a guaranteed 80 per cent efficiency when fired with oil, gas, or with a combination burner for oil or gas. Fuel changeover is simple and makes it possible to take advantage of seasonal fluctuation in fuel prices.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 128. Please indicate the capacity range in which you are interested.

Improved Vibrators

An automatic centrifugal clutch, cutting in and out at 1,700 rpm, has been announced as standard equipment for GV-1, GV-2, and GV-3 gasoline-powered vibrators, according to the Marvel Equipment Co., 215 Eagle St., Brooklyn 22, N. Y. The Model GV-1 has a 1⅝-inch vibrator head with a driveshaft of 7 to 35 feet, available in 7 and/or 14-foot sections. The Models GV-2 and GV-3 have 2⅜-inch vibrator heads with driveshafts up to 42 feet, in 7 and/or 14-foot sections.

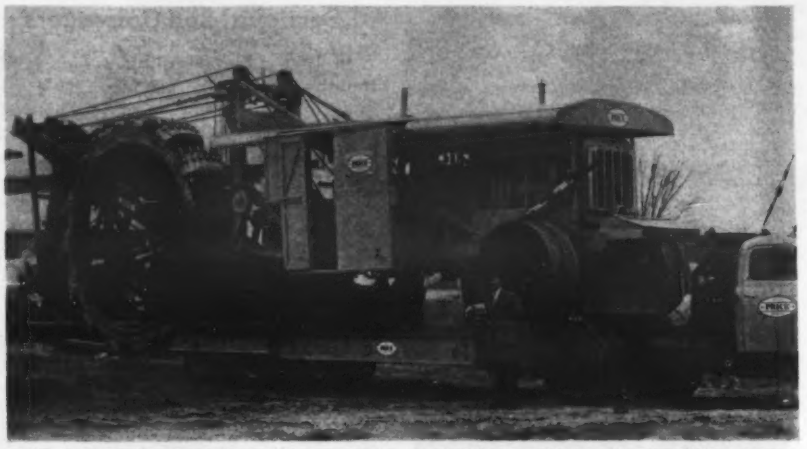
These vibrators are powered by standard Wisconsin and Briggs & Stratton air-cooled engines and have ratings from 2 to 5 hp. They can be mounted on a swivel base with carrying handles or on a wheelbarrow mounting with swivel base.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 106.

Heavy-Duty Trailers

A complete line of heavy-duty trailers with capacities ranging from 11 to 40 tons is fabricated by Birmingham Mfg. Co., P. O. Box 2838, Birmingham, Ala. All standard units in this group have a narrow, flat gooseneck and straight rear deck. They have an overall width of 8 feet and overall length ranging from 23 to 30 feet. The company points out that in addition to the 11 standard models, it has facilities to produce special designs with capacities from 3 to 150 tons.

All frames are electrically welded of open-hearth-steel shapes. The low-bed trailers have selected car-stock oak decks surfaced to 2¾-inch thickness.



Birmingham heavy-duty trailers come in 11 standard models with capacities from 11 to 40 tons. Special designs can be made in capacities up to 150 tons.

Bendix Westinghouse air brakes with emergency breakaway are furnished as standard equipment on all trailers except the low-speed units, which have manual brakes. Rear loading ledges are provided on all units with side ledges available as extras.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 165.

The NEW Watson-Stillman

Hydraulic Power Tool Bulletin A-5

Not a catalog . . . but a condensed power tool reference brochure with all material reduced to its simplest form.

Easy to read—this brief but compact booklet gives you, at a glance, information on modern Watson-Stillman Jacks, Pumps, Benders and Shears.

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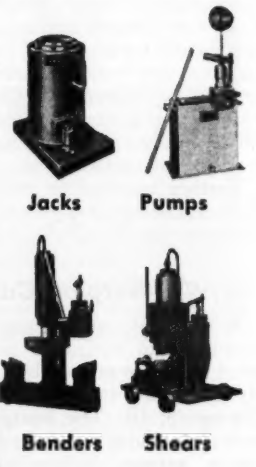

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7012 CENTRAL AVENUE CLEVELAND 4, OHIO

Clipper's new concrete saws cut at speeds of 5 fpm in concrete and 12 fpm in asphalt. Maximum depth of cut is 6½ inches.

Three Portable Saws For Concrete Cutting

Three new portable concrete saws, designed for practical and economical use on a small patch job as well as on production sawing of contraction joints on streets and highways, have been developed by Clipper Mfg. Co., Concrete Saw Division, 2800 C Warwick, Kansas City 8, Mo. The cutting speed of the new unit is 12 feet per minute in asphalt, and up to 5 feet per minute—1 inch deep—in concrete. The maximum depth of cut is 6½ inches.

Features claimed for the new units are: floating three-point suspension to eliminate blade binding as the saw is moved over rough surface, positive screw feed, and streamlined design for easy handling.

The company makes two gasoline-powered Clippers, the Model C-75 with a 7½-hp engine, and the Model C-130 with a 13-hp 2-cylinder engine. Each is counterbalanced to "turn on a dime", the company says. Models C-15 and C-20 with electric motors are produced specifically for plumbers, electrical contractors, and building maintenance departments. The Model CHD makes it possible for present owners of Clipper Model HD's to convert their masonry saws for concrete sawing.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 213.

War-Surplus Catalog

A 48-page catalog of war-surplus material and hydraulic power equipment has been offered by Groban Supply Co., Inc., 1507 S. Michigan Ave., Chicago 5, Ill. The equipment it describes includes ac electric generating plants, pumps, hydraulic equipment, electric motors, and welders. Each product is fully illustrated and prices are given for all items. The 8½ x 11-inch booklet includes 18 illustrated pages on the application and installation of hydraulic power.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 206.

To Help Plywood Users

Two new field representatives are making the rounds for the Douglas Fir Plywood Association, trade-promotion group for the 58-factory plywood industry on the west coast. Richard E. Anderson is the new man in the southwest, with headquarters in Dallas, and Stuart Williamson will operate from San Francisco headquarters. This brings the Association's staff of field representatives to seven, the other men being in Tacoma, Wash.; Chicago, Ill.; Washington, D. C.; New York City; and Ames, Iowa.

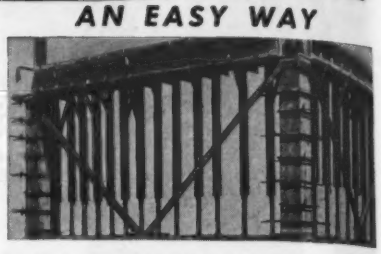
Sectional Belt Conveyors

In many bulk-hauling or material-moving operations the loading or discharge point changes as work progresses. This requires a conveyor which can be readily and economically shifted and extended. A new 4-page folder on Transall sectional belt conveyors points out that they are designed to meet this demand. Issued by Transall, Inc., 109 N. 11th St., Birmingham 4, Ala., the catalog describes the complete unit—head, tail, and intermediate sections.

Each piece may be handled by one man, the literature points out. All parts are interchangeable and the belts come in widths of 24, 30, and 36 inches, with other widths available on special order. Conveyor lengths may be extended up to 3,000 feet, the company says. Photographs illustrate the component assemblies and the sectional conveyor in use.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 145.

SYMONS FORMS · SHORES · COLUMN CLAMPS
Doing a Good Job -
AN EASY WAY



FORMS—Cut labor costs 50%. Only three pieces of hardware—bolt, wedge, form tie. Tie remains in the concrete, bolt and wedge may be reused. Bolt holds the forms together and holds the ties both ways. No nails or spreaders. To strip forms take out wedges, remove bolts, then pull forms up or out. Ties break back inside the wall 1" from the surface. Made up ready for use or you may purchase the hardware for building your own forms.

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"Our equipment performs better, stands up longer with GULF QUALITY LUBRICANTS and FUELS" *says Peter Salvucci*

Peter Salvucci, Waltham, Mass., has a $957,946 contract for extensive highway construction work in the Towns of Acton, Boxboro, and Littleton, Mass. The projects are well ahead of schedule.

Peter Salvucci is one of a number of prominent New England contractors who find that it pays to use Gulf quality lubricants and fuels.

There are three solid reasons why so many leading contractors select Gulf products. One is performance—the kind of lubrication and fuel efficiency that insures smooth, dependable operation and low maintenance costs. Another is the high type of engineering service Gulf provides. Third, Gulf's prompt delivery service.

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Terteling Hurries Grand Coulee Canal

Transition Below Pumping Plant Includes a Canal, Round and Square Tubes, and an Earth-Fill Dam

OUT in Washington's Columbia Basin, below Grand Coulee Dam, the U. S. Bureau of Reclamation is preparing feverishly for the Great Day. It is expected to come in the early summer of 1951, when two giant 65,000-hp motors start two throbbing pumps to running, each at the rate of 720,000 gpm. The pumps will charge the canal and irrigation system completed thus far, so that by 1952 the initial 6-pump installation at Grand Coulee Pumping Plant can deliver water.

Beginning at the end of the headworks structure which will discharge water from the big pumping tubes, J. A. Terteling & Sons, a Boise, Idaho, contractor, built a vital 9,500-foot transition section that will take water from the pumps and transfer it easily to the equalizing reservoir. In the $5,074,000 USBR contract was an earth-fill dam, a concrete-lined canal, twin round tubes, and transition sections that will carry the 16,000 cfs of water.

No contract currently in force is more important than Terteling's, because if irrigation is to start in 1952, the 700,000-acre-foot equalizing reservoir will have to get its water in 1951.

North Coulee Dam

About a mile and a half down the Grand Coulee from the pumping plant is the dam that will form the northern end of the equalizing reservoir. Known as North Dam, it stretches across the coulee for 1,400 feet. It is 145 feet high from the lowest foundation rock, and is of earth-fill construction. The core of the dam was built of impervious, moistened earth. On both sides of this zone are other zones of gravel and rock. This semipervious material is topped by coarse rock to prevent water and wind erosion.

South Dam has already been finished under another contract, and the 27-mile reservoir area is now being cleared under another contract.

Zone 1, impervious material, totals 623,000 cubic yards. Zone 2, gravel, totals 122,500 cubic yards, with 93,500 yards of additional rock. Zone 3, rock, totals 344,000 cubic yards.

To place the Zone 1 material, Terteling went into a deposit of impervious earth above and beyond the south abutment. A Bucyrus-Erie 120-B electric shovel was selected to load a fleet of 6 Euclid 24-yard belly-dumps. This combination easily produced about 6,000 cubic yards in an 8-hour shift.

Since the deposit was dry, a unique jetting system was employed which worked very well. An A-frame on a D8 Caterpillar tractor drove 28-foot perforated pipe into the earth ahead of the shovel. Water was then admitted under pressure, and it soon moistened the lift. As the shovel dug the material, it also mixed it, and the finished product was much nearer to its compaction optimum than if no water had been applied.

The Euclids dumped on the fill, and as a dozer leveled off the dirt, any remaining water that was necessary was applied by two 4,000-gallon water tank sprinklers, drawn by Caterpillar DW10's.

C. & E. M. Photo

This is the Blaw-Knox form Terteling used on the conduit section of his canal contract. It consists of two inner barrels and an outer form gantry mounted on rails.

The 8-inch lifts were then sheepsfoot-rolled to get a 98 per cent density requirement.

Zone 2 material, or gravel, was produced and hauled spasmodically, to

(*Continued on next page*)

SASGEN

New Electric-Powered CHAMPION DERRICK

Boom only can be supplied for use with old-style Mast and bottom

Single line cap. 300± @ 100 feet per minute

Double line cap. 600± @ 50 feet per minute

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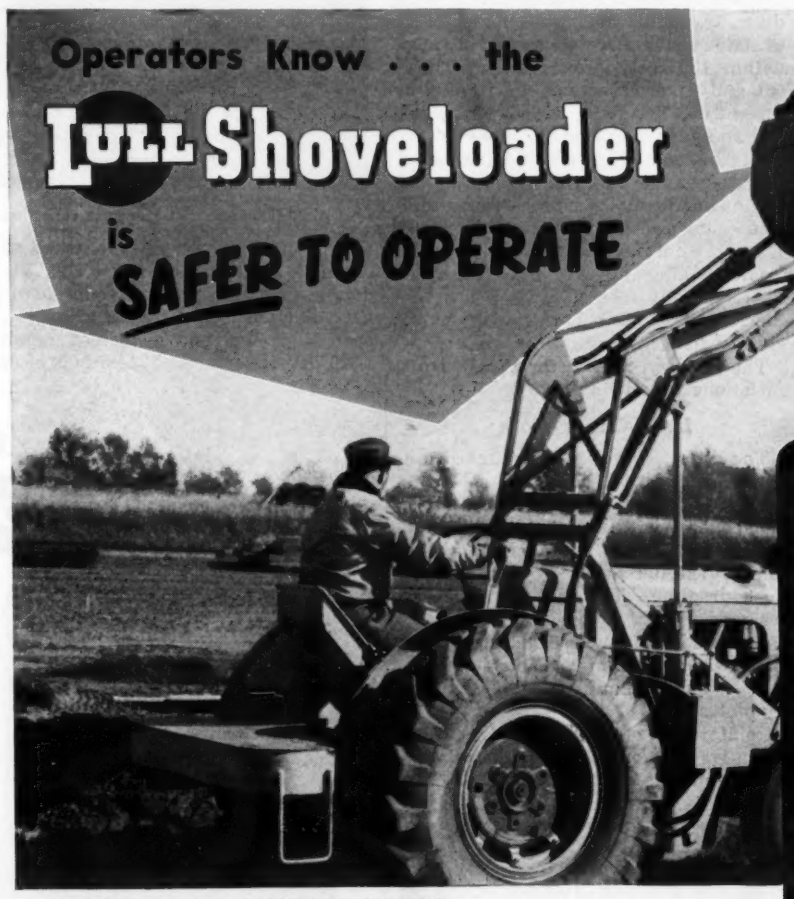
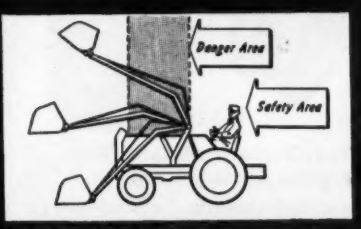


SAFER from MOVING PARTS and FALLING ROCKS



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OPERATORS KNOW their position on a loader is important to their safety. On a LULL SHOVELOADER, they know they are well clear of moving arms and falling rocks. They know they have full freedom of movement without fear of the giant they operate.

OPERATORS ARE CONFIDENT in the SHOVELOADER'S safe, versatile operation. They like its safer lifting, loading, scraping, bulldozing, digging and transporting. Accidents cost man hours, law suits, and increase insurance rates. Get the facts about LULL SHOVELOADER'S safety today!

THE LULL LOG LIFTING FORK, like all other LULL attachments, has the same LULL safety design as the SHOVELOADER. Even with the high lift of the lifting fork, the operator is well clear of falling logs and moving arms. Log stacking can be dangerous but not with a LULL LOG LIFTING FORK.

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Terteling Hurries Grand Coulee Canal

(*Continued from preceding page*)

keep up with the Zone 1 progress. It was possible to bulldoze this material down into a trap, where eight 10-yard end-dump Euclids and five 14-yard belly-dumps picked it up for transportation to the fill.

Zone 3 rock was also hauled by these units, and the progress of Zone 3 matched that of Zone 2. The rock for this zone was loaded by a Northwest 80-D shovel to the end-dump Euclids, which carried it to the dam.

North Dam was unusual, perhaps, because of its foundation. Hard basalt rock cliffs comprised the north abutment; the south abutment was an ancient granite formation; but the center section was placed over a bottomless deposit of a hard, clay-like blue Latah shale. There were no core walls in the center section, but concrete core cutoff walls were placed in both abutments at the center line. Pressure grouting was carried 210 feet deep into the fractured basalt.

An Elaborate Transition

The pipes and headworks, constructed by Morrison-Knudsen Co. and Peter Kiewit Sons Co. under a separate contract, which conduct the water from the pumps to the feeder canal, are elaborate. Starting off at the top of the mountain, we find twelve 12-foot discharge pipes leading up from the ultimate pumping installation. The headworks is designed to change these twelve 12-foot round openings into a like number of 12-foot square sections.

From the end of the pump conduits, a feeder canal runs 1.8 miles. Terteling had a 5,000-foot lined section of this canal, which has a 50-foot bottom, is 28 feet deep, and has 1½ to 1 sideslopes. Its bottom lining is 7-inch reinforced concrete, while the slope lining tapers from 7 inches at the bottom to 5 inches at the top.

At the end of the canal are transitions which change the canal to twin openings 25 feet square. These then change to 25-foot round conduits, which connect to cut-and-cover concrete conduits, through treacherous material so unstable that concrete work had to stay within 100 feet of excavation. These cut-and-covered sections consist of twin tubes 2,000 feet long, with 2-foot walls and an inside diameter of 25 feet.

At the end of this section, another square-reverse puts the water into 480 feet of lined canal, which carries it still farther toward the equalizing reservoir. There are checkworks to prevent water from backing out of the reservoir. There are 810 feet of canal below the checkworks, and vertical wall chutes 410 feet long leading into the reservoir.

This variety of structures called for variations in pouring and forming.

Lined-Canal Work

The canal sections were roughed out by a Northwest 95 shovel and a Northwest 80-D dragline. The slopes were then covered with a 3-inch rock blanket, compacted to close tolerance by a Hyster Grid Roller handled by the Northwest dragline. This rock blanket is designed to carry seepage down to the base of the slope, where it can be collected by tile drains. The slope was fine-graded by hand, and checked by templates.

Reinforcing steel for the concrete lining was set on concrete blocks, and tied. Concrete for the sides and bottom of the lining was dry-batched and hauled over the canal to a Rex 34-E double-drum paver. The concrete mix, per cubic yard, consisted of 970 pounds each of 1½-inch and ¾-inch aggregate; 1,325 pounds of sand; 523 pounds of cement; and enough Protex air-entraining agent to make 4 to 5 per cent air.

The mixed concrete was transferred to the pour by a Gar-Bro bucket handled by a Northwest crane.

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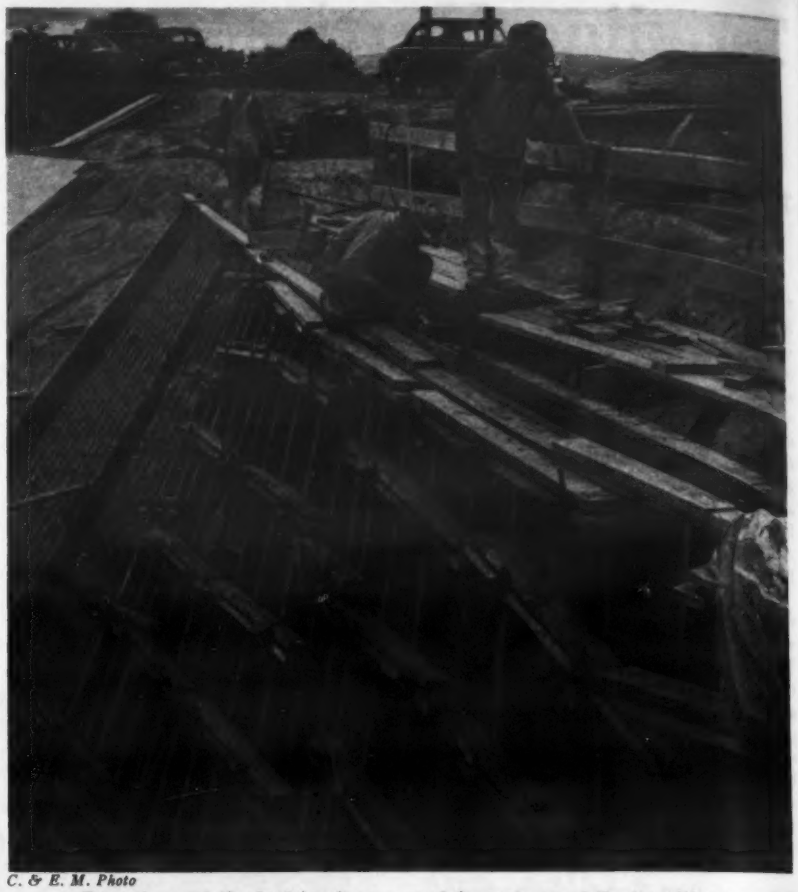
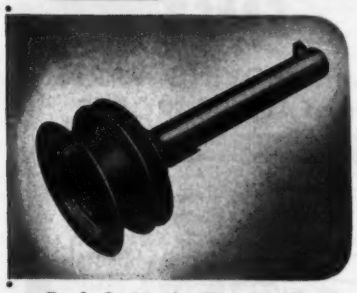


C. & E. M. Photo

Carpenters put the final touch on a wood form at one of the transitions.

2 ways to make crane operations pay more



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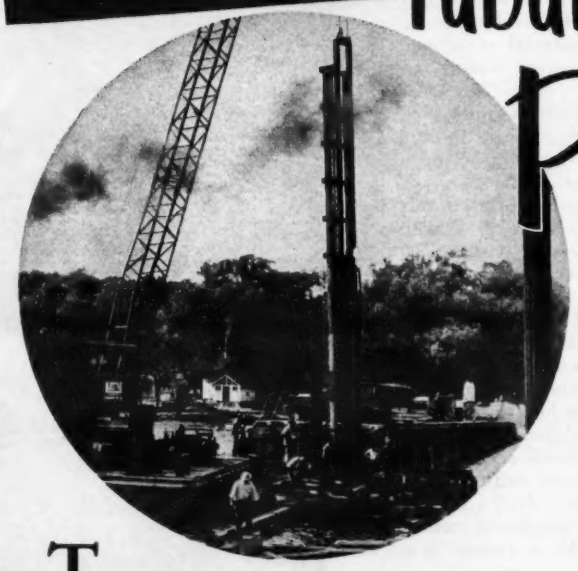
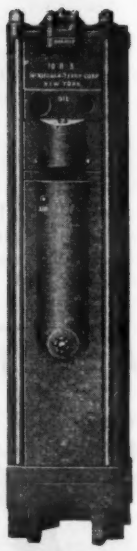
DRIVING 75 FOOT Tubular Piles





THESE 75-foot tapered, fluted, tubular piles with 20-foot extensions were driven to a minimum bearing of 40 tons each by a McKiernan-Terry 10-B-3 Double-Acting Pile Hammer in constructing the new highway bridge at Spring Lake, Michigan. ●To insure accurate driving and to protect these long, costly piles from damage during driving, the contractors, Luedtke Engineering Company, chose McKiernan-Terry equipment. For 50 years, whether for driving timber, sheet steel, concrete or pipe piles, contractors have grown to depend upon powerful, safe-to-operate McKiernan-Terry Pile Hammers. ● 17 sizes of hammers and extractors are available in the complete McKiernan-Terry line. Write for bulletin giving full data.

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McKIERNAN-TERRY CORPORATION, MANUFACTURING ENGINEERS

19 PARK ROW, NEW YORK 7, N.Y. *Plants: Harrison, N. J., Dover, N. J.*

MK-282

The lining was made in a series of slabs 14 feet square, with Techkote mastic joint-sealing compound placed immediately in the opening. The base slab was handled by careful bucket dumping and a shop-made spreader on a steel trusswork frame, which screeded the fresh concrete off to grade. Four Viber electric vibrators worked from the front of the screed and consolidated the material. A Gardner-Denver and an Ingersoll-Rand air tugger pulled the cables which moved the spreader along.

Joints were cut by a heavy steel knife lowered into the concrete from a second bridge. The steel-trowel finish was applied from this bridge, and the joints were carefully hand-finished. Sealtex white-pigmented curing solution was sprayed on after the mastic was in and the slab had its final finish.

Progress was unusually good. It was not uncommon to see a small crew place 266 cubic yards in 20 of the 14-foot blocks, and several days saw 25 blocks completed. This does not, of course, compare to mechanical slip-form work, which was impracticable here.

Conduit Sections

Shifty formations in the cut-and-cover conduit sections created one of the most unusual problems of the job. It was common to see a Northwest dragline and Euclids removing the excavation, a Link-Belt Speeder trench hoe preparing the base for drainage under each conduit, and the liner forms being set—all within a space of about 125 feet. And if you looked hard enough, you might even see a D8-dozer backfilling in behind.

A Blaw-Knox steel form was used for the conduit placing. The form consisted of two inner barrels, and an outer form gantry mounted on rails. The forms had hydraulic bottom jacks and two side jacks. The forms were long enough to place two 25-foot conduit sections, side by side, at one time.

The form-setting procedure consisted basically of first setting the bottom reinforcing steel, then jacking the barrel forms into place, then setting the remaining steel, and then pulling the outside form into place and bracing it for the pour. By working a systematic schedule, Terteling made a 25-foot double pour every other day.

On a conduit pour, the batch trucks brought their material in to a Rex 34-E dual-drum paver, which was spotted on the top of the ditch nearby. Supported on the gantry form was a Stemm Bros. pouring platform, with two self-propelled hoppers to place the concrete in the forms. A Stemm conveyor took the concrete up to the hoppers. Several sets of doors in the forms permitted the concrete to be placed quite easily.

C. & E. M. Photo
Concrete placing on canal slabs for the Terteling contract—a Northwest crane, a Gar-Bro placing bucket, and a Rex 34-E paver.

Electric internal vibration was used here.

All concrete came from a central Blaw-Knox batch plant, which was supplied with sand and aggregate by the Bureau of Reclamation. This plant was manual. Superior Type 2 bulk cement was batched through a Noble cement silo.

There was considerable wooden formwork, especially in the transitions, in this 49,400-cubic-yard concrete job. Where wooden forms were needed, they were prefabbed in a central yard which had power tools. The panels were then trucked to the site, assembled, and field-checked. As a general rule wooden forms consisted of 1-inch surfaced facing, 2 x 6 studs, and 2 x 6 wales with ⅝-inch form rods extending through the pour.

Terteling pushed the project rapidly toward completion, and by this month expected to have the 1.7-mile canal system and North Dam complete. That is ahead of the schedule set up in May, 1949, when the job was started.

Personnel

Bob Ross, Project Manager, supervised field work for the contractor, with Gene Hill as Excavation Superintendent. Pat O'Donnel was the USBR's Resident Engineer.

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Gives you high density compaction. Ready to repave immediately. No temporary paving. No spoil dirt to haul away. Due to high density compaction, requires little asphalt in replacement. Cuts cost of tamping and breaking of concrete many times. Can be worked manually or automatically. 160' Compressor for full capacity or 105' Compressor for ½ capacity. For further particulars, see your nearest dealer, or write Department C.

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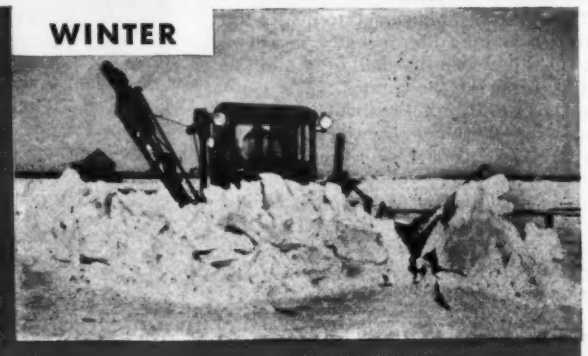

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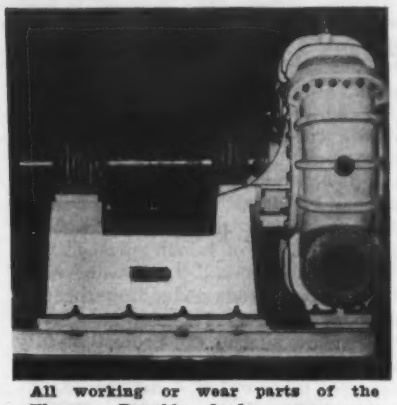


All working or wear parts of the Thomas Durable dredge pump are made of Ni-Hard, an abrasion-resistant nickel-chrome-iron alloy of 550 minimum Brinell hardness.

Abrasion-Resistant Sand and Gravel Pumps

A new solids-handling pump with long-life working parts has been announced by Thomas Foundries, Inc., 3800 Tenth Ave. N., Birmingham, Ala. All working or wear parts of the Thomas Durable dredge pump are made of Ni-Hard, an abrasion-resistant nickel-chrome-iron alloy of 550 minimum Brinell hardness.

To prevent breakage and to insure the ultimate in long life, a water jacket is provided between the shell liner and the outer casing of the pumps. The confined body of incompressible water reinforces the shell liner and transmits to the strong shell or casing the shock or impact from heavy rock, and from hydraulic effects such as rams and blowbacks. Thus, the company says, the Ni-Hard shell liner can be worn almost paper-thin without breakage.

These pumps are produced in a complete range of sizes from 6 to 16-inch pipeline diameter. They are designed for all heavy solids-handling jobs, including sand, gravel, rock, and slate, as well as for general dredging work. One installation of the Thomas dredge pump, a Series HL 10 x 8-inch unit powered by a 200-hp diesel engine, moved approximately 2,700 gallons of water per minute under a total head of 140 feet and pumped 150 to 175 tons of sand and gravel per hour. Under these conditions, the company says, Ni-Hard liners, impellers, and rings outlasted alloy-steel units 4 to 7 times.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 144.

Thin-Wall Sockets

Twenty single-hexagon (6-point) thin-wall socket wrenches have been added to the Proto line by the Plomb Tool Co., 2209 Santa Fe Ave., Los Angeles, Calif. With their thin walls, these sockets can be used in restricted areas, wherever corresponding double-hexagon (12-point) types will fit. Although thinner than regular power sockets, they are guaranteed for power or hand use in service work.

Single-hexagon sockets safely fit and turn undersize nuts, as well as those that are rusted or damaged, the company says. They permit safe work on stubborn nuts without danger of slipping, and they do not chew up brass or other soft nuts. The sockets are made of special alloy steel. Seven of the twenty additions are ⅜-inch-drive regular sockets with openings of 5/16 to 11/16 inch. Six are ⅜-inch-drive deep sockets with ⅜ to 11/16-inch openings. Seven are ½-inch-drive regular sockets with ⅜ to ¾-inch openings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 163.

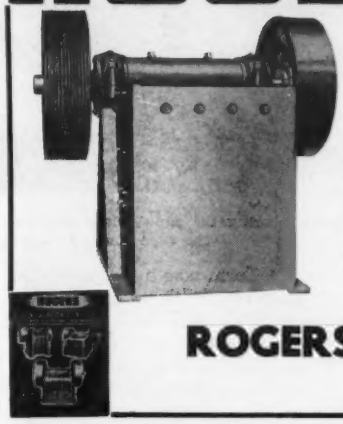
The new Proto thin-wall hex sockets can be displayed in this No. 9900J Merchandiser, which facilitates selection of needed sizes by users.

Unto the Fourth Generation

For the fourth consecutive generation, a son has followed his father to the presidency of the 110-year-old firm of R. E. Dietz Co., Syracuse, N. Y., manufacturer of kerosene lanterns and motor lamps.

In September, Robert E. Dietz was made Chairman of the Board, and his son Gerry J. Dietz was promoted to the Presidency of the company. He has been with the firm for 13 years.

ROGERS
BETTER ROCK PRODUCTS BY STAGED REDUCTION



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The Von Ruden Mfg. Co.'s hydraulic chain saw operates from the power takeoff of a tractor, Jeep, truck, or any suitable stationary engine.

Hydraulic Chain Saw Uses Power Takeoff

A hydraulically operated chain saw which works from the power takeoff of a tractor, Jeep, truck, or any suitable stationary engine has been developed by Von Ruden Mfg. Co., Claremont, Minn. Its long flexible hose allows the operator to work at a considerable radius from the power source. The saw can be operated in any position and at any angle to notch, fell, and buck logs and limbs for land clearing, wood-lot sawing, or other applications.

The operator has positive control over the saw at all times. A control lever starts and stops the saw without stopping the power source. A safety-by-pass valve protects the operator and the saw. There are only two moving parts in the motor and two moving parts in the pump. These rotate on heavy-duty roller bearings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 192.

Portable Conveyor For Raising Bricks

The new lightweight Brik-Toter conveyor developed by Mar-Rail Conveyor Co., 560 York Ave., Pawtucket, R. I., also handles glazed tile, cinder blocks, shale blocks, cement bricks, sand, lime, short lengths of lumber, etc.

It is 20 feet long and 14½ inches wide, weighs 385 pounds, and can be moved by two men. Load capacity is over 1,200 pounds evenly distributed. Bridge-type trussed construction and torque frame eliminates twist and sag. The conveyor is equipped with a 12-inch-wide 3-ply rough-top vulcanized-rubber belt. The bed is constructed with 16-gage 2-inch-diameter tubular rolls, ball-bearing mounted, spaced on 12-inch centers and assembled in heavy-gage 3 x 1-inch pressed-steel channel frames.

A totally enclosed ½-hp gear motor furnishes the drive for the Brik-Toter. A gasoline motor drive is also available. The fixed speed of the belt is 60 fpm and tension is adjusted through takeup screws and self-aligning grease-sealed ball bearings with Alemite fittings mounted in slide.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 235.

No hod-carrying up ladders when the Brik-Toter takes over. It can take a load of 1,200 pounds yet is light enough to be moved by two men.

Flexible Hose and Fittings

A new bulletin, No. 113, issued by Aeroquip Corp., Jackson, Mich., illustrates and describes the company's line of industrial hose and fittings. It includes complete specifications as well as instructions on assembling the fittings, which are detachable and re-usable, to hose lines. The literature also gives detailed information on Aeroquip Self-Sealing and Breakaway couplings. It points out that these products are designed to reduce inventory, operating costs, and down-time, and are easy to assemble.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 154.

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Van Dorn POWER helps you finish drilling jobs FASTER!

Wherever you're drilling holes, in construction work or equipment maintenance, turn the jobs over to Van Dorn Electric Drills! You'll find them easier to handle; sturdily built to withstand rough usage; high-powered for non-stalling, trouble-free performance. 25 models from ¼" to 1¼" capacity in steel, double in hardwood. Drive twist drills, wood augers, Hole Saws. See your nearby Van Dorn Distributor for free demonstrations. Write for detailed catalog to: THE VAN DORN ELECTRIC TOOL CO., 787 Joppa Road, Towson 4, Md.

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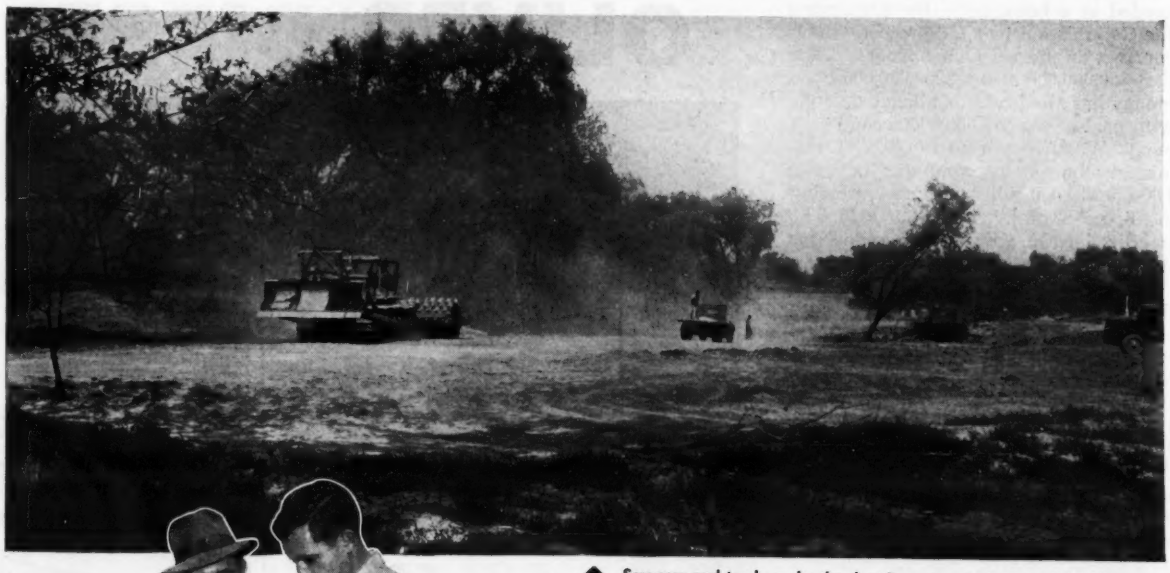

L. A. Arute (at left), contractor, discusses a detail of the busy project with his timekeeper, J. Adams.

New York Thruway Takes Shape

These pictures, taken recently between Chittenango and Liverpool, in central New York, show construction along an 18-mile section of the Mohawk and Ontario Thruway. The new 4-lane road is part of the high-speed, limited-access New York Thruway, which is to span the state from Buffalo to the vicinity of New York City. Contractor: Arute Bros. Inc., New Britain, Conn. Hinged bar mats were furnished by Bethlehem.

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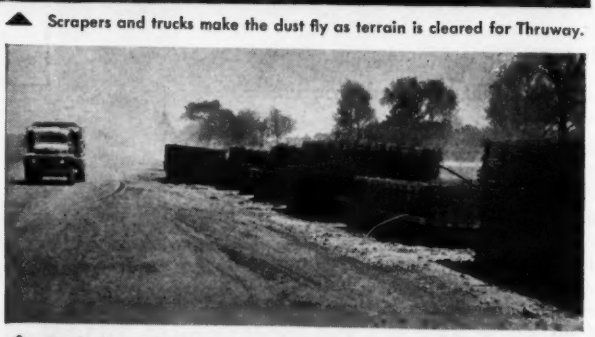

▲ Scrapers and trucks make the dust fly as terrain is cleared for Thruway.

▲ Stockpile of Bethlehem Hinged Bar Mats, ready for use as paving progresses. Bethlehem Hinged Mats fold over double, are easy to install.

▲ James Barnes (left) and Joseph Lowe, inspectors, New York State Highway Dept., examining Bethlehem Bar Mat stored adjacent to new road.

▲ One lane completed, three to go. The New York Thruway has long, gradual turns and slight grades, to permit the efficient handling of high-speed traffic.

N. C. Road Program Hits All-Time High

1950 Is Big Year in Plan to Hard-Surface 12,000 Miles of Secondary Roads; A Typical Contract

✦ ROAD construction in North Carolina promises to set an all-time high in 1950 as the 12,000-mile hard-surfacing and 35,000-mile stabilization program of the State Highway and Public Works Commission is steadily pushed ahead. More road mileage is expected to be finished this year under the $200,000,000 bond program, now in its second year, than in any other one year of the state's history. The secondary-road paving plan began in the fall of 1949, and will take from four to six years for completion. In the few months of last year, 137 miles of new pavement were laid under the bond program.

This year contract letting has proceeded at a brisk pace. By late spring the Commission had 152 projects under contract on the secondary program. The first $50,000,000 of the $200,000,000 bond money has already been allocated, along with part of the $75,000,000 second segment. Weather permitting, the Commission hopes to complete between 3,000 and 4,000 miles of hard-surfacing in this program by the end of 1950. The stabilized-road mileage scheduled for this year is proportionately greater.

To date the State Highway Commission with approximately 64,000 miles of roads supervises the largest state system of highways in the country. North Carolina is one of only four states that exercises jurisdiction over all rural roads as well as the roads designated as state highways; the other three states are Delaware, Virginia, and West Virginia. The great increase in the Tar Heel State's road mileage was brought about in 1931 when the state's entire county road system, about 45,000 miles, was transferred to the State Highway Commission.

$200,000,000 Bond Program

This revolutionary change in policy laid the foundation for the philosophy that the State should furnish all-weather roads for all its citizens. People more than traffic get the emphasis in a rural-road program, especially in a state like North Carolina whose some 4,000,000 inhabitants are well dispersed over the entire area of the state. There is no single large city that accounts for the bulk of the population, as is the case in many other states.

From 1931 to the beginning of World War II the State's highway system expanded steadily, but construction of new roads was all but halted during the war years. With the war over, the demand for better farm-to-market roads increased, especially where the lack of hard surfaces made many miles virtually impassable in bad weather. Undeveloped sections of the state also required adequate highway transportation. While more than 3,000 miles of secondary roads were paved from 1945 to 1949, it was not enough to furnish any real relief to the road problem.

Then in June, 1949, the people by referendum approved a legislative bill providing a $200,000,000 rural-road bond issue for hard-surfacing 12,000 miles, and improving by stabilization another 35,000 miles of secondary roads. The bill provided that the current 6-cents-a-gallon gasoline tax be raised to 7 cents, with the revenue from the extra cent being used to help pay interest on the money borrowed. The average interest rate on the first $50,000,000 segment of bonds sold was only 1.57 per cent. This low rate compares most favorably with the 5 per cent interest charges of 1921 when the State sold bonds to launch its first big road program.

Contractor Opposition

The 1949 Road Bond Act authorized specitic allotments of the $200,000,000 for each of the state's 100 counties based on population, area, and road mileage. Of the total amount, 10 per cent may be used by the Commission for equalization purposes anywhere in the state. A portion of the fund was earmarked for the purchase of road-building machinery, for the State planned to do part of the work, mostly stabilization, with its own forces.

The Commission has always done a certain amount of its construction and maintenance work with state forces. It also uses the labor of its state prison system on the roads. When the Commission allocated $5,000,000 of the bond issue to buy road-building machinery chiefly for its stabilization work, Nello L. Teer, a Durham, N. C., contractor, sought a restraining order compelling the Commission to use the entire bond fund for road construction only. The

(*Continued on next page*)

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The new Oliver "88" is a natural for industrial wheel tractor operations. It's remarkably easy to start . . . requires no starting preparations. Overall efficiency is high due to superior air and fuel mixture. Efficient burning of fuel and air assures exceptional fuel savings. Prolonged piston head pressure increases lugging ability under heavy loads.

You'll find it will pay dividends in increased load handling ability . . . lower operating costs to investigate the new Oliver "88" Diesel Industrial Wheel Tractor. Your Oliver Industrial Distributor will give you the complete story.

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A complete line of Industrial Wheel and Crawler Tractors

North Carolina Supreme Court upheld the Highway Commission, however, and Teer's suit was dismissed.

As the program developed, about 70 per cent of the work is being handled by contract, and the remaining 30 per cent by state forces. With more miles of roads being let to contract than ever before, the bond program has attracted contractors from the neighboring states of Virginia, South Carolina, and Georgia. The work being done by state forces such as grading, stabilization, and base course has never been as desirable to contractors as paving, a higher-priced item that can be completed more quickly than the other phases of road building.

Hard-Surface Roads

This all-state work, with no Federal aid, is seldom on new location, but consists of improving existing secondary dirt roads. The roadway is graded and shaped; a base course is laid and then topped with a bituminous hard-surface pavement, varying in width from 16 to 20 feet. In general state forces graded the road, laid the base course, shaped the shoulders and ditches, while contractors did the paving. The paving cost of a secondary road with a 16-foot pavement runs around $2,700 a mile; with an 18-foot pavement, slightly higher at $3,000 a mile.

Three different types of bases are used in the program—cement-stabilized, soil, and crushed-aggregate macadam. Pavements of three different types are also employed — bituminous surface treatment, sand-asphalt surface course, and bituminous-concrete surface course, type F-2. Varying geographical features of the state, ranging from the high peaks of the Great Smoky Mountains in the west to the flat coastal plain in the east, require different types of road construction. Some western counties, for example, prefer roads of crushed stone, feeling that they can get more mileage out of the money allocated, and also that such surfaces are safer in mountainous terrain.

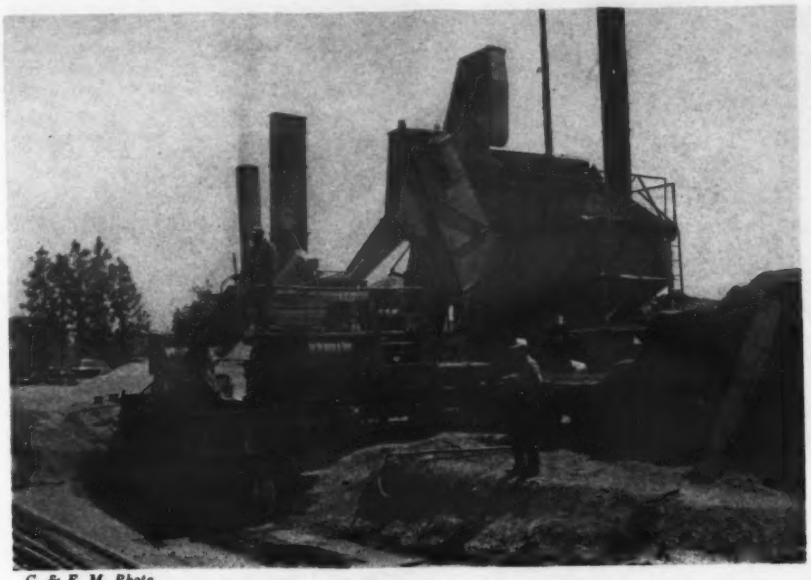
Since many of the roads being improved are limited in length, the Commission has awarded contracts covering groups of roads in the same general vicinity. Such contracts included enough work to stimulate interest among road-building companies. This of course resulted in better prices to the State from the contractors, and lower overall costs on the projects.

Typical Contract

One such typical contract was awarded by the State Highway Commission to the F. D. Cline Construction Co. of Raleigh, N. C., on a low bid of $107,689 for paving 38.8 miles of highway with bituminous-concrete surface course, type F-2. Work started early last April and was completed by the end of June. The project extended into three counties in the Sixth Division: 8 roads totaling 28.7 miles in Lee County; 2 roads totaling 8.2 miles in Moore County; and a single 1.9-mile road in Chatham County. Paving widths are both 16 and 18 feet. The average cost over the entire project is $2,775 per mile.

A soil-type base course had been previously laid by state forces to a 26-foot width across the roadway. It consisted of a sand-clay mix 6 to 8 inches in compacted depth. Sand and clay were spread on the subgrade, then well mixed by harrows and pulverizers. Water was added when necessary. Motor graders next shaped the base course which was compacted by rubber-tire rollers.

The base was primed with MC-O cutback asphalt, applied full width by a distributor at the rate of 0.3 gallon to the square yard. This was done about two weeks in advance of the paving.



C. & E. M. Photo

To turn out bituminous concrete for its North Carolina contract, the Cline company set up this Barber-Greene continuous-mixing plant near Sanford in Lee County.

Continuous-Mixing Plant

To turn out the bituminous concrete, the contractor set up a Barber-Greene continuous-mixing plant near Sanford in Lee County. This was at the very south end of the entire project, but the closest available location where a good grade of sand might be obtained locally. The maximum haul to the various road jobs with the hot-mix was 25 miles.

Gravel, the coarse aggregate in the mix, was purchased from the Cumberland Sand & Gravel Co. of Fayetteville,

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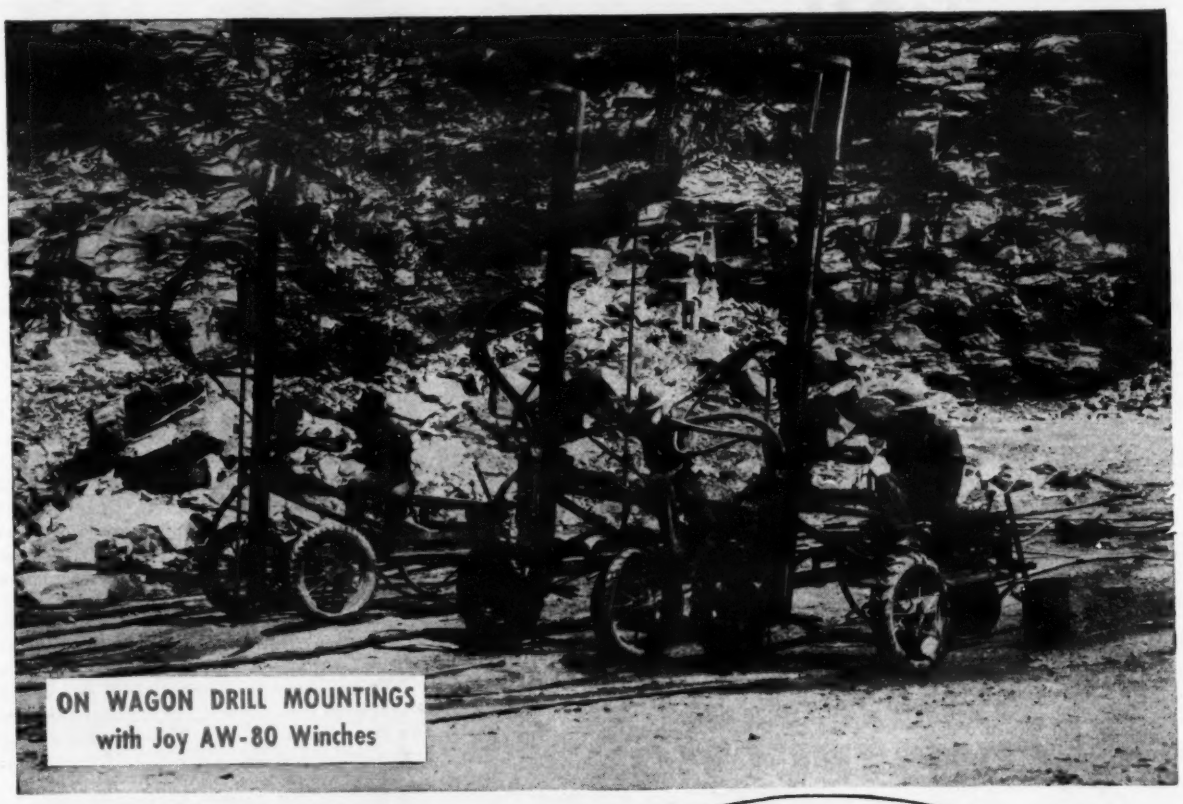

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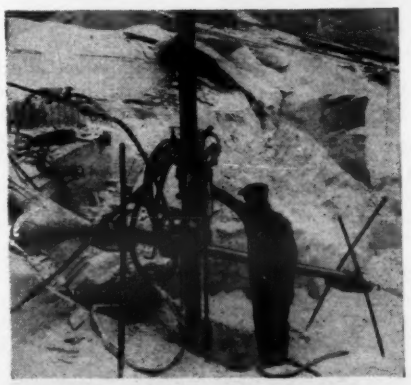

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JOY Silver Streak Drifters feature the exclusive *Dual Valve* with positive cushion control. It gives a harder, more powerful punch—literally makes air do more work. What's more, JOY Drifters *last longer*—give you more feet of hole with less maintenance. Exclusive *cadmium plating*, inside and out, inhibits rust, prevents scoring during run-in, and at the same time, adds power by permitting closer piston tolerances. ● Ask for a trial demonstration on JOY Drifters—the T-300, T-350 or T-400—*prove their all-around superiority right on the job!*

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Precision workmanship—fully guaranteed.

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NATIONAL SALES, INC.

812 North Main St. - - Wichita, Kansas

N. C. Road Program Hits All-Time High

(Continued from preceding page)

N. C., and delivered to the plant after a 30-mile truck haul. AP-3 asphalt cement, 85 to 100 penetration, was supplied by the Mexican Petroleum Corp. It was hauled to the plant from Savannah, Ga., in 4,000-gallon tank trucks and stored in two tanks, each holding 12,000 gallons. Texaco fuel oil, delivered from Wilmington, N. C., was kept in an adjoining 10,000-gallon tank.

A tractor-scraper unit moved the sand from the nearby pit to the stockpile. At that point a clamshell crane filled the 20-yard receiving hopper on the plant with sand and gravel. The aggregate dropped out of the hopper onto the bottom of a 30-foot cold elevator that lifted the material to a 20-foot long x 8-foot-diameter dryer. Dual burners heated the material which was then raised inside a 35-foot enclosed hot elevator. At the top the heated sand and gravel spilled out over a ¾-inch screen. The material passing went into the mixing box where it was blended with the bitumen.

C. & E. M. Photo

A Barber-Greene Finisher lays an 8-foot lane of blacktop on a road near Sanford, N.C. A Ford truck dumps to its hopper.

Diesel-Driven

The plant was driven by one gasoline and three diesel engines. The gas unit, a Buda, functioned with the burners, while the diesels—Internationals TD-18 and TD-14, and another Buda—ran the elevators, dryer, exhaust fan, and pugmill. An Economic boiler supplied the necessary steam for heating and plant operations.

The mix is proportioned as follows:

	Per Cent
Gravel	20.0
Sand	73.5
Asphalt	6.5
Total	100.0

Gradation of the aggregate falls within these limits:

Passing	Retained On	Per Cent of Total by Weight
¾-inch	....	100
¼-inch	No. 4	5-40
No. 4	No. 10	10-50
No. 10	No. 200	35-80
No. 200	....	0-10
Bitumen	....	5-7.5

Up to 12 trucks, holding 8 to 10 tons a load, were hired on a ton-haul basis to transport the hot-mix from the plant to the road being paved. Hauls averaged from 12 to 15 miles one way. As the trucks left the plant they were weighed on a Fairbanks-Morse beam scale.

On the road the mix was laid in half-width lanes by a Barber-Greene Finisher in a single course averaging 1 inch in depth which is about 100 pounds to the square yard. The temperature of the mix at the time of being placed was around 350 degrees F. A Huber 8-ton tandem roller compacted the material. An average of 700 tons of mix was laid by the single finisher in a 12-hour day. For the 38.8 miles of pavement, 19,060 tons of blacktop were required.

Personnel

The F. D. Cline Construction Co. was represented on the project by E. Marvin Dean, Superintendent. Cecil Pearce was Plant Foreman. The plant crew included a foreman, 7 skilled workers, and 13 laborers. The paving crew numbered a foreman, 2 machine operators, 3 rakers, and 3 laborers.

For the Highway Commission Claude C. McBryde was Resident Engineer on the project, which is located in Division 6 of which T. G. Poindexter is Division Engineer. The Commission is headed by H. W. Jordan, Chairman. William H. Rogers, Jr., is State Highway Engineer, and William E. Hawkins is State Construction Engineer.

Offers New Wall Chart For Metric Conversions

A new 11 x 25-inch wall chart designed to help the user make rapid conversions from meters to feet and inches is offered by Robert S. Mayo, Civil Engineer, Lancaster, Pa., designer and manufacturer of steel forms for tunnels, aqueducts, and sewers. The chart is divided into four parts offering decimal conversion of feet and tenths of a foot to meters, meters and tenths of a meter to feet, inches to meters, and inches to decimals of a foot. The wall chart also illustrates some of the products made by the company, such as tunnel shields, air locks, pneumatic grouters, jumbos, tunnel cars, and other special equipment for tunnels and mines.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 119.

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Now you can locate bedrock and plot its contour in minutes instead of hours. To learn more about this new and PROVEN method of bedrock finding without detailed and costly drilling, write *1336 North Utica.*

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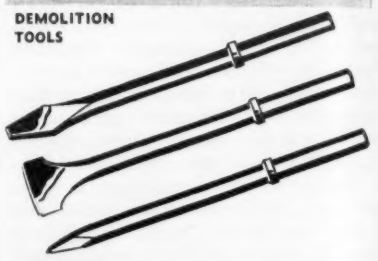
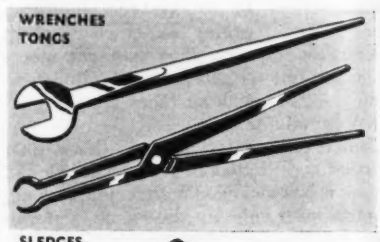
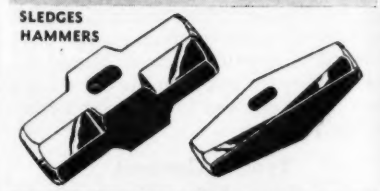


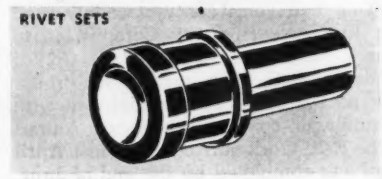
WRENCHES TONGS



SLEDGES HAMMERS

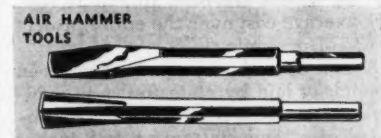


RIVET SETS



DRIFT PINS

AIR HAMMER TOOLS



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Write for Bulletin No. 75 showing the complete line.

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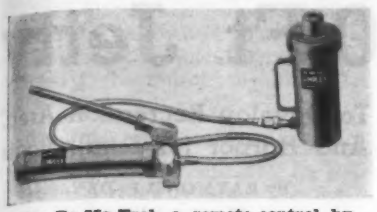

The Re-Mo-Trol, a remote-control hydraulic ram and pump, operates where limited space makes the use of self-contained jacks impossible.

Remote-Control Rams Jack in Tight Spots

A complete new line of remote-control hydraulic rams and pumps has been announced by Templeton, Kenly & Co., 1006 S. Central Ave., Chicago 44, Ill., to supplement the company's full range of mechanical and hydraulic industrial jacks. The Re-Mo-Trol units operate where limited space or other difficulties make the use of self-contained jacks impossible. Their light weight and portability increase efficiency on many jacking jobs, the company says.

The Re-Mo-Trol enables the operator to lift, pull, or push from a distance and in any direction—up, down, sideways, or at an angle. Units of 30-ton and greater capacity feature a center-hole tubular ram which enables their use as pullers. A rod or bolt inserted through the ram and secured over the ram head can be pulled through the ram as it extends. Center-hole construction also simplifies rigging requirements on many jobs, says the company; because the pull is always in a straight line, much less effort is required.

Re-Mo-Trol rams are available in seven models, including a telescoping ram, ranging from 10 to 100-ton capacities. The pumps operate at a maximum of 10,000 psi, with overload safety protection.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 193.

Bulletin on Snow Loaders

"A Haiss loader does the work of 80 men", according to a new bulletin on snow loading by machine, issued by the George Haiss Mfg. Co., Inc., Division of Pettibone Mulliken Corp., 141st to 144th St. on Park Ave., New York 51, N. Y. Fully illustrated, the bulletin describes and offers complete specifications on the Models 300 WS, 75 WS, and 75 CS. These are, respectively, a loader with swivel conveyor, a wheel-mounted unit with swivel chute, and a crawler-mounted unit with a swivel chute. Operating dimensions, capacities, methods of loading, and important features of the Haiss snow loaders are included in the bulletin.

This literature may be obtained from the company by requesting Bulletin No. H-300-75S, or by using the Request Card at page 16. Circle No. 122.

Company Reactivated

The Municipal Service Co. of Kansas City, Mo., a contract engineering firm which manufactures and installs mechanical equipment for water and sewage plants, resumed operations this year for the first time since 1942. The company was idle during the war years because J. F. Prichard & Co. of Kansas City, the parent organization, was occupied with war contracts, and because there was little municipal construction.

Converts Pickup To 10-Man Carrier

If you want to ask your crew out to the job in style, or if you have some visiting firemen you want to show around the project, Dixie Tallyho, Inc., of Fairburn, Ga., suggests that you use its one-piece unit which converts a standard ½-ton pickup truck to a 10-man station wagon. The Dixie Tallyho is safe, comfortable, weatherproof, and stylish, the company says. A one-piece unit that can be loaded or unloaded by one man in a minute or so, it is constructed of tubular steel. The top is heavy canvas, reinforced with hardwood slats. The sides, when let down, have heavy clear plastic windows and are clamped tightly to keep out rain and weather. The seats feature comfortable spring action, the company says, and the wood bottom and backs are padded and covered with Duran plastic.

Something new for pickup trucks to convert them into station wagons, the Dixie Tallyho. It is both safe and stylish, the company says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 157.

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The complete assembly of cylinder head, liner, piston and rod is interchangeable as a unit in all P&H Diesel engines — 1, 2, 3, 4 or 6-cylinder models. Simpler design with fewer parts saves you time — saves you trouble — saves you money. It's another good reason for standardizing on P&H Diesels. For literature, write Diesel Division, Harnischfeger Corporation, Port Washington, Wisconsin.
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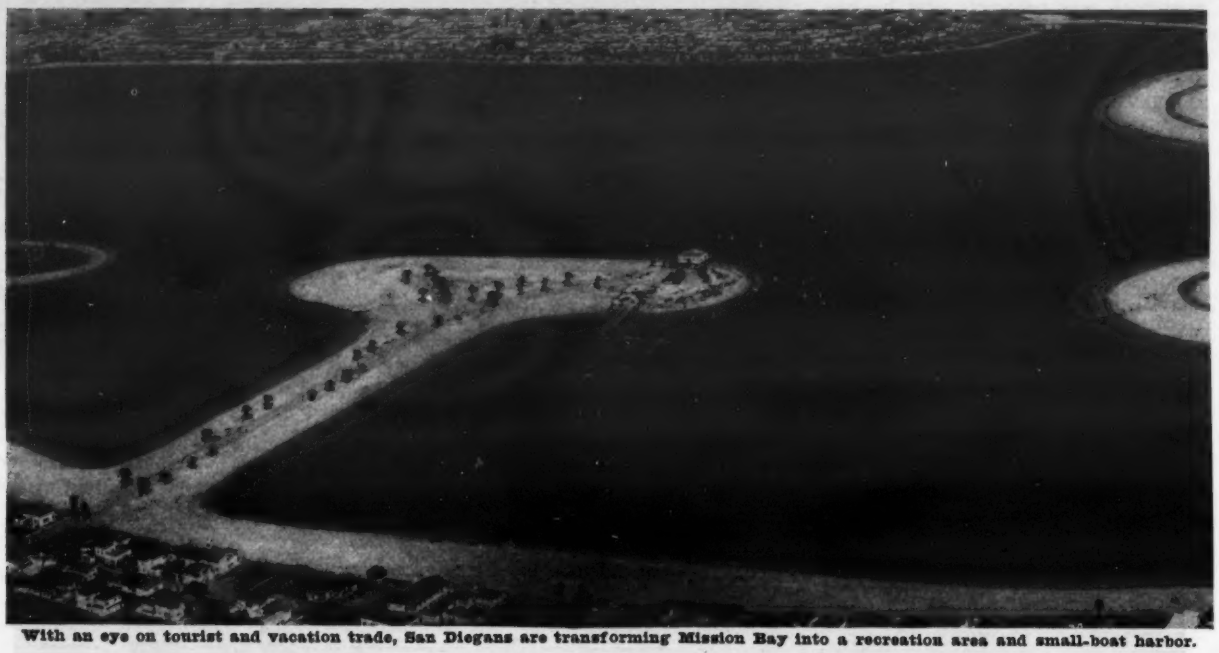
Heavy Rock Handled for 3,400-Ft. Jetty



With an eye on tourist and vacation trade, San Diegans are transforming Mission Bay into a recreation area and small-boat harbor.

To Develop Recreation Area, And Harbor for Small Boats

By RAYMOND P. DAY,
Western Editor

✦ SOME of southern California's heaviest construction is taking place on a civic recreation development in San Diego, known as the Mission Bay Project.

The mud-flat transformation will eventually build a small-boat harbor, a flood channel for the San Diego River, and 35 miles of shore line for swimmers. The City of San Diego, the State of California, and the Army Corps of Engineers—representing the U. S. Government—are participating in the project.

Of several contractors at work on rock-jetty construction, dredging, highway realignment, and grading, Clyde W. Wood, Inc., of North Hollywood has been perhaps in "highest gear". Clyde Wood's $1,000,000 contract with the Corps of Engineers wraps in one pack-

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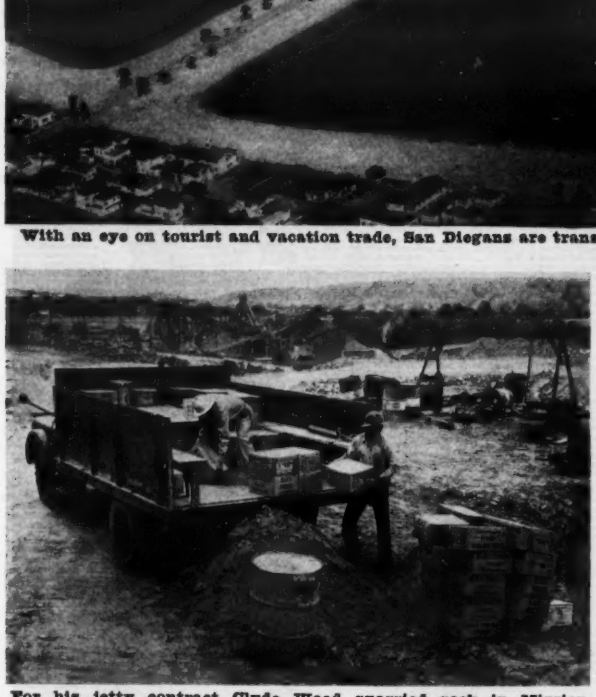
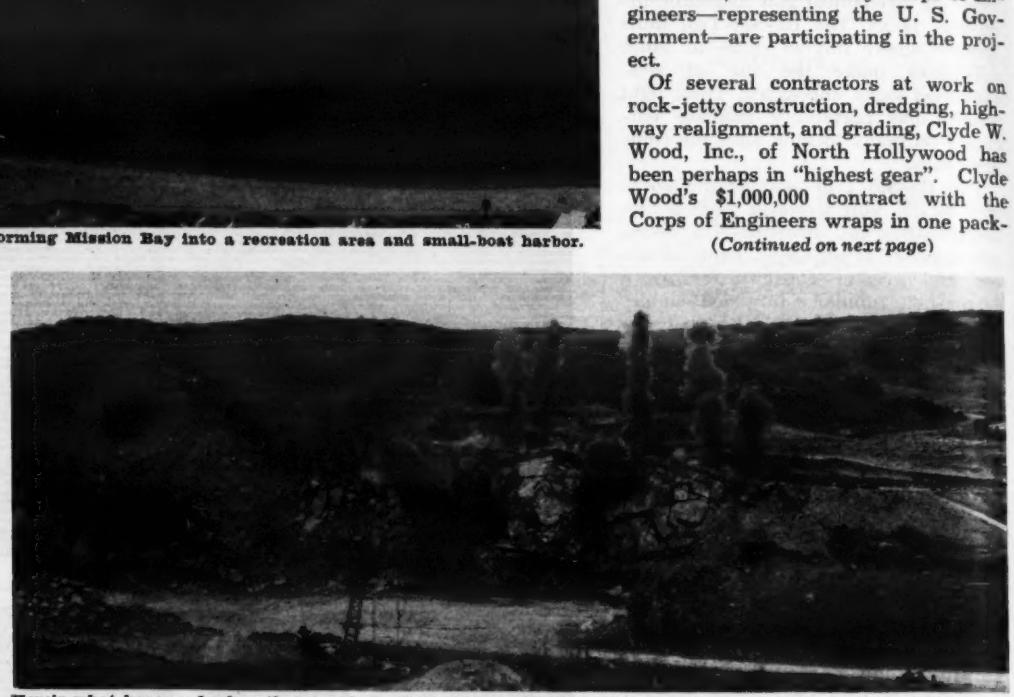
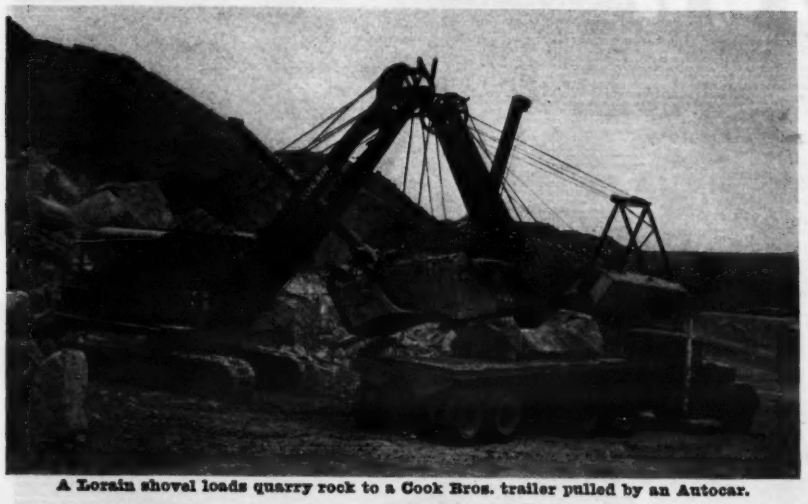


For his jetty contract Clyde Wood quarried rock in Mission Gorge. Here his men unload Hercules black blasting powder.

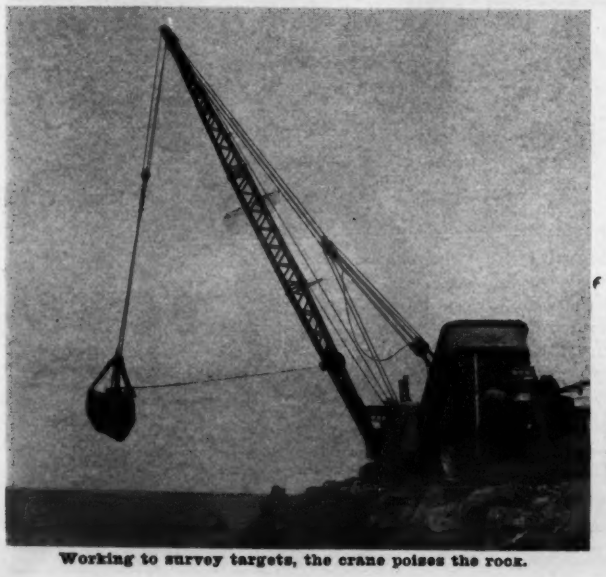


Here's what happened when they touched off 22,000 pounds of powder in the quarry. The blast at left is blowing through a seam, but the other seven holes are doing their work well.

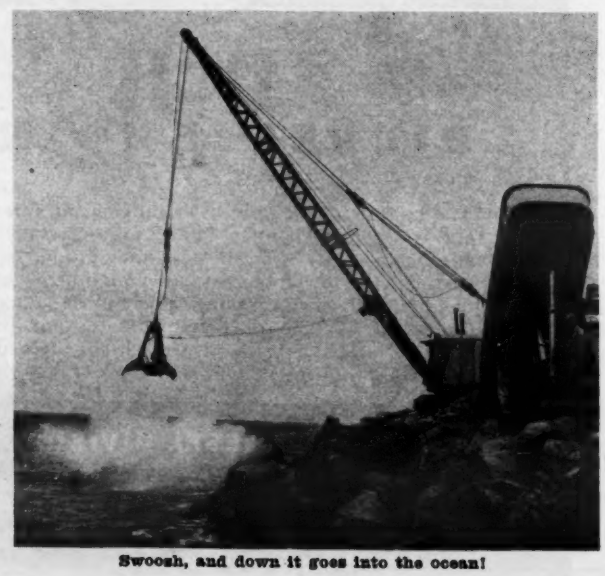


A Lorain shovel loads quarry rock to a Cook Bros. trailer pulled by an Autocar.

With a truck on the jetty turntable, the Manitowoc crane whirls rock into position.



Working to survey targets, the crane poises the rock.



Swoosh, and down it goes into the ocean!

Craneman Watson and Foreman Nutt.

age a 3,400-foot rock jetty and a 35,000-yard chunk of excavation. The job got off to a fast start in June, 1949, and was scheduled to be finished by July 31, 1950.

City Planners Got Worried

A case of jitters is responsible for the whole thing. Shortly after the war, aircraft plants began to lay off employees. People began to leave. "Apartment for Rent" signs began to appear, and San Diego's city planners began to get worried. Would the city revert to its prewar status and become a sleepy, carefree place again; the envy of the coast?

With an eye on the tourist and vacation trade that always, in the past, had meant ready money for the city, planners began to explore the idea of a development program in the shallow tidal basin just north of town. Why not tie San Diego's million-dollar climate to a recreational development of even greater magnitude?

The early estimates were discouragingly high. Then, when engineers and planners began to study the thing in its entirety, flood-control features began to assume No. 1 prominence. Hitched to that wagon, a train of thought gathered speed and eventually rolled through the 79th Congress in 1946, when the Federal participation features were authorized. In 1947 the 80th Congress appropriated the first million dollars for jetty construction, and the dream was on its way to fulfilment. You can't convince San Diegans that the 80th was a "Do Nothing" Congress!

Floodway features include a 16,000-foot channel of 115,000-cfs capacity, protective levees, three large rock jetties extending into the Pacific Ocean, and dredging. The first two jetties, 1,500 and 3,800 feet long, were finished November 8, 1949, by Macco Corp. of Clearwater, Calif. Clyde Wood built the North Jetty. Federal work for the future includes the flood channel from the ocean to U. S. 101 and east beyond the Morena Boulevard Bridge, and completion of inner-harbor dredging to a depth of 20 feet.

The State of California, too, has followed through on its agreements. In 1945 it granted Mission Bay to the City of San Diego. In 1947 it authorized the project and agreed to pay for right-of-way for the flood channel, bridge construction, side drainage structures, and utility relocation.

So far as the City of San Diego is concerned, voters in 1945 approved a $2,000,000 bond issue. The City Council earmarked an additional $1,500,000 for the project and committed the City to complete the project within 5 years after the Corps of Engineers completes its work.

City planners like Glenn A. Rick, San Diego City Planning Director, and Tom Allen, Mission Bay Project Engineer, expect private enterprise to take over shortly. Private money is expected to develop concessions, build docks for the 3,200 small boats that are expected to use the harbor, and install new businesses which will serve the thousands of vacationers who will use the 35-mile shoreline.

The water area of Mission Bay was about 2,400 acres at high tide before the work began in 1946. After completion, the water area will be 1,900 acres; 1,700 acres will have a depth of 8 feet and the remaining 200 acres will be 20 feet deep at low tide.

Before all that work is finished, however, many contractors will have used the same clever ingenuity which Clyde Wood's men recently demonstrated in the North Jetty contract.

Rock Quarry Opened

Clyde Wood's rock-production job totaled about 320,000 tons, in five sizes. Arrangements were made to quarry this rock in Mission Gorge, about 15 miles east of the jetty, in a site originally developed by the V. R. Dennis Co. It was possible here to expose an 85-foot face with minimum stripping. The rock was a biotite gneiss probably derived from a granite, and because of the presence of wide seams and a 50 per cent requirement for larger sizes, about 40 per cent of the quarry output was waste.

With the exception of one 5-foot-square coyote hole which went in 50 feet and then made a 120-foot T, all explosives were placed in 9-inch-diameter drilled holes. Sunk from the top by a Bucyrus-Erie 29-T, they were spaced 30 feet apart both ways, and carried about 5 feet below quarry floor grade. The 29-T was diesel-powered and mounted on crawler tracks. It averaged about 2½ feet an hour in granite, and managed to keep well ahead of the jetty crews.

A few occasional lifter holes were drilled into the base of the cliff by two Ingersoll-Rand wagon drills, using Timken tungsten-carbide bits and Timken steel. Air power came from two compressors: a 500-foot Gardner-Denver and a 315-foot Schramm. As a rule the portable compressors were spotted within hose range of the wagon drills, and no air header pipe was required.

The only other drilling was done by Ingersoll-Rand jackhammers. These machines had to drill occasional shallow holes to hold a small amount of powder, just enough to crack the massive chunks left after the main blasts.

The 85-foot churn-drill holes were thoroughly opened up at the bottom by 40 boxes of Hercules 60 per cent Extra Gel, used as a springing charge. The pocket thus opened was then loaded. Two boxes of dynamite went in first, to take care of any dampness at the bottom. After the dynamite charge had been capped with Primacord, forty boxes of Hercules black blasting powder were then poured in. Earth stemming was shoveled to cover the pocketed charge about halfway up the column. Two boxes of 60 per cent gelatin were then placed to crack the wall at its midpoint. Earth stemming went in to the top of the hole.

Primacord leads from 8 to 12 holes were then tied in to a Primacord trunk line, terminating in a No. 6 electric blasting cap and copper wire, which led off to a hand blasting machine. Some excellent shots were pulled by this method with an absolute minimum of overbreak. Rock breakout averaged one cubic yard for every 0.6 pound of powder.

Drilling and blasting were done under the watchful eye of a good-natured, competent, little powderman of Mexican ancestry, P. W. Ruis. The quarry crew, completely at ease with Ruis handling the powder, soon dubbed him "Little Pete", and recognized him for the artist he was at handling explosives. When Ruis split mammoth 100-ton rocks with less than a handful of powder, men felt such confidence in the little powderman that they watched with interest from only 50 feet away. Ruis never set off even one of these "safe" shots, however, before he had inspected the area care-

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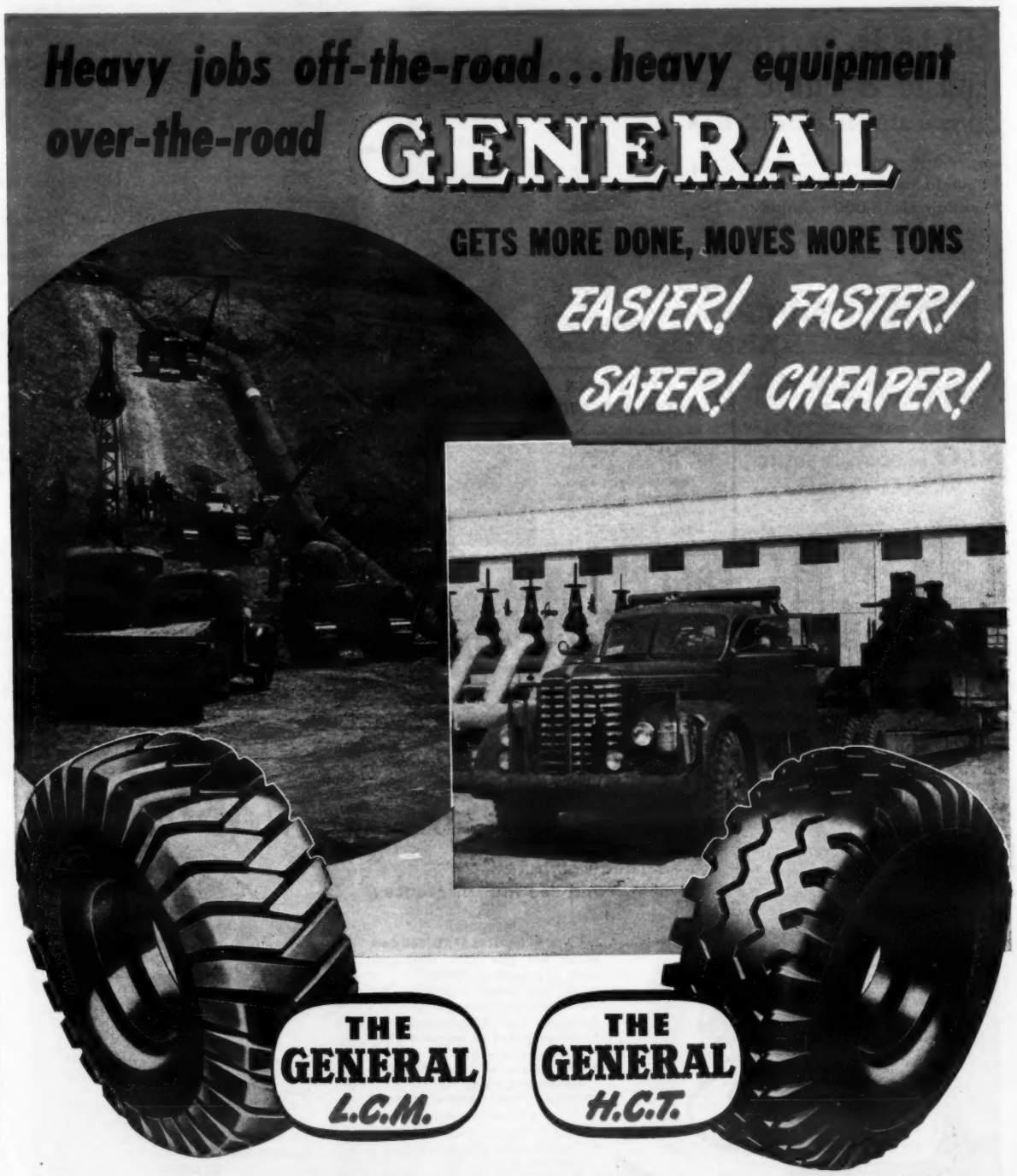

Here's General's dual-purpose team. The General H. C. T. with more, safe traction to go in and get the load . . . and take it long distances over the highway. The General L. C. M. to work 80% off-the-highway. Massive, deep lugs develop extra traction under heavy loads. Let your local General Tire Distributor show you how you can make more profit with this Top-Quality dual-purpose Truck Tire Team.

SPECIFY GENERAL TIRES ON NEW EQUIPMENT

Heavy Rock Handled For 3,400-Ft. Jetty

(*Continued from preceding page*)

fully and made a shrewd appraisal of the way the pieces were likely to roll.

Experimental Shovel on Loading

Several power shovels were used on rock loading at the quarry, but the one which pulled visiting contractors from all over southern California was an experimental, improved model of the Northwest 80. According to Northwest's field mechanical engineer who is studying the performance characteristics of the improved machine, it is one of two such shovels in the nation.

The Northwest shovel incorporated the same basic equipment in general as the original Model 80 machine, but the judicious rearrangement of parts made it much more efficient. Larger boom-point sheaves were designed to lengthen cable life. The machine had a new-type shovel boom, with a single-dipper stick rather than the divided, two-pronged type formerly used. The machine had a longer digging radius than the old 80.

On the improved model, a quick changeover to a dragline can be made without adding a section to the gantry. There is no more haulback-line fighting. With the crowd now built into a single unit, it can be disengaged easily and simply if a quick changeover to dragline use is necessary.

The improved Northwest shovel was equipped with a 2½-yard Amsco dipper. It worked right up against the rock face, loading the largest rock in a constant bruising battle. According to Northwest's field engineer, the company tried to find the toughest rock job in the country to proof-test the new machine, and this was it. He, Clyde Wood's supervisors, and several visiting contractors were enthusiastic about the new machine's performance.

A Lorain 820 diesel shovel, with a 2-yard Amsco dipper, was also used. A Model 801 Koehring crane was used as a standby to load derrick stone.

The machines loaded jetty rock into a fleet of 13 fast Autocar prime movers. Twelve of these units pulled special trailers built by Cook Bros. One unit had a Cook-built flat rack, and was used mostly to transport large cap rock 12 tons and over. Two Euclid end-dump trucks were used within the quarry to dispose of the waste rock.

Wood's General Superintendent, Andy Weesner, gave some performance statistics on the hauling units. The 13 units had hauled over 14,000 loads when CONTRACTORS AND ENGINEERS MONTHLY visited the job, without any unit losing a single shift. Each unit was making from 7 to 8 loads per 10-hour day through traffic, over the highway. Loads averaged 15½ tons. Maintenance costs had been extremely low, and were limited to routine mechanical repairs and parts replacement. Two mechanics and three welders, working at night, were able to keep the hauling units in top shape.

Weesner, while praising the equipment, also had a good word for his mechanical force.

"Records like this are no accident", he explained. "The mechanics had to watch like hawks for the possibility of future trouble. A lot of their work was checking—careful checking. Several times they installed a new engine in one night, and the truck was ready to go again the next morning, without a hitch. When you've got good men, you can get that kind of performance."

Each unit averaged about 100 tons a day. A total of the weight tickets usually showed from 1,300 to 1,400 tons for the hauling fleet. The five rock sizes started with core rock, in quarry-run pieces up to 1,000 pounds. "A" rock consisted of 2-ton stones, with an allowable 50 per cent under that figure. "A-1" stones were 50 per cent under and 50 per cent over 6 tons. "A-2" stones were centered on 8 tons, and "A-3" on 12 tons. In general the heavy sizes were held at the quarry, especially the A-3 rock, which was used mostly on the seaward end of the jetty.

Jetty Construction

Jetty construction clicked like clockwork, thanks to a scheme of organization that permitted rock to be placed as rapidly as the trucks could haul it in. Credit was also due to the design of the jetty, which used core rock for the entire base up to elevation minus 10 on the sides and to zero (MLLW) for 22 feet of the center portion.

Corps of Engineers designers had specified a structure 16 feet wide at the top, with 1½ to 1 sideslopes extending down to the ocean bottom. The deepest water was 33 feet, on the outer end. The ocean floor at the North Jetty slopes downward at a general constant grade of 1½ feet per 100 feet, out to deep water.

From a builder's standpoint, it was no easy task to maneuver equipment on a 16-foot jetty. Clyde Wood whipped this problem of potential delay by building a heavy steel turntable on a circular framework roughly 16 feet in diameter. The turntable, which stayed up within 50 feet of the Manitowoc 3000 placing crane, permitted the trucks to drive out practically to the end of the jetty. It took less than 2 minutes for the little Wisconsin engine and Foote gears to swap ends on a truck, which then dumped its load in front of the crane. It was moved ahead by the crane when necessary.

(*Concluded on next page*)

Hi-Lo Jr. carries up to 3 cubic yards on a single axle Truck

• • • and not exceed the single axle weight limitation of 18,000 pounds which prevails in many States.

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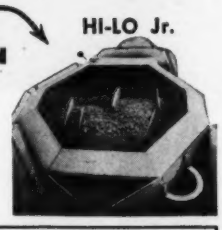

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CONCRETE TRANSPORT MIXER CO.
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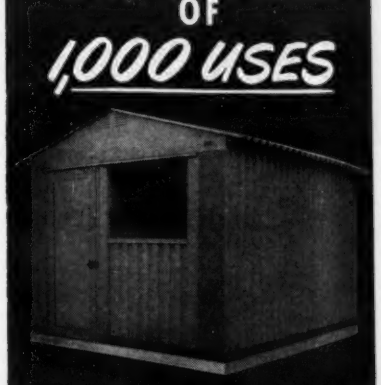
A 10' X 12' LOW COST STEEL BUILDING OF 1,000 USES



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USF HANDY-HUT
No Field Welding or Riveting
2 Men Can Erect
Expansible!

Just the ticket for a field office, tool house, storage house, pump house or any one of a thousand uses for contractors and engineers. The USF Handy-Hut is an all-steel, prefabricated formed steel frame that simply bolts together with box corrugated roofing and siding sheets that attach with clip-and-wedge fasteners. No special tools are needed, no field punching, welding or riveting is required. Meets fire and windage codes most localities and is suitable for either permanent or portable use. Multiple units may be erected to accommodate any size requirement without special engineering.

USF also produces larger steel buildings of the same general construction in 10' and 12' clear heights with 26' or 30' span widths for erection in length multiples of 13'-4" to any desired size.

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USF United Steel Fabricators Inc. Wooster Ohio

KNOW THE *Facts* about VIBRO-PLUS PRODUCTS

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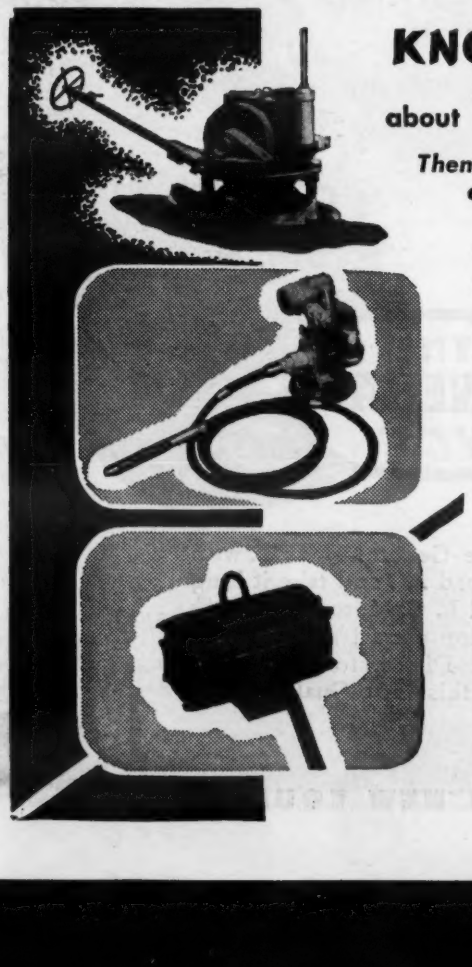

TERRAPAC
The Vibro-Plus TERRAPAC Soil-Compactor will give 95% compaction down to a depth of 3½ feet.
The job tested TERRAPAC has proven its value in road work, airports, and back fill compaction.
- Self propelled or tractor drawn
- One man operation
- 2½ gallons of diesel fuel consumption per day

ROLLGEAR "INTERNAL VIBRATOR"
No Other Vibrator But Rollgear Has:
- High frequency (15,000) V.P.M.
- Flexible shaft speed of only 3600 R.P.M.
- A direct snap coupling between engine and shaft. NO TOOLS NEEDED
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- Lighter in weight with a heavier kick than ANY OTHER VIBRATOR
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- Saving of a bag of cement per cubic yard of concrete
- Besides being used on all types of concrete forms, it can be used on chutes, vibrating tables, etc.

To insure a superior concrete product utilize Vibro-Plus equipment and know-how.
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Working to a line of survey targets, the Manitowoc crane first placed a line of foundation core rock out as far as it could reach. This was about 60 feet. Then the heavier top and cap rock came in and was placed. Outer rock was all 8 tons and over. A rock grapple built by Clyde Wood was used for large cap stones, while a three-pronged rock clam was used when core rock was being placed.

Each of the heavy outer stones was placed with exceptional care. A man who was experienced in the placing of large rock spotted each rock as the crane swung it in. Each rock was keyed into the structure, and tipped slightly to resist wave uplift. The result was a tight, heavy structure that would resist the worst the mighty Pacific could do.

The ocean tried to wreck the work on several occasions. Heavy ground swells crashed in and rolled over the top of the jetty requiring the crane to pick up the turntable and move back from the end of the jetty for continuous periods of three or four days while Bob Nutt at the jetty and Harry Schultz at the quarry waited with their crews for better weather. When it came, they pushed the work so hard that the progress line again jumped out ahead of the scheduled completion mark, and stayed there.

Several weeks before Clyde Wood finished, men and equipment of Guy F. Atkinson Co. moved in to start another contract—this one on the channel, levees, and a highway bridge. Franks Dredging Co. had the 18-inch hydraulic dredge Dallas busy, cutting the entrance channel between the inner bay and the ocean. How the Dallas diked itself in and raised the water so it could work at elevation plus 6 is another story; one that will be featured in a future issue of this magazine.

Colonel W. D. Luplow, District Engineer of the Los Angeles District of the Corps of Engineers, was in general charge of the Army contracts, with W. J. Leen as his Operations Chief and Gordon Lilley as Resident Engineer.

New Hot Spraybar For All Distributors

A new asphalt spraybar said to be nonclogging and no-drip, and to fit all distributors, has been announced by the Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave., S. E., Minneapolis 14, Minn. The Bros Spraymatic, built for handling heavy bitumen, is a full-circulating 3-section hot bar, designed to eliminate nonuniform distribution, leaky valves, fat and lean streaks, and clogged orifices.

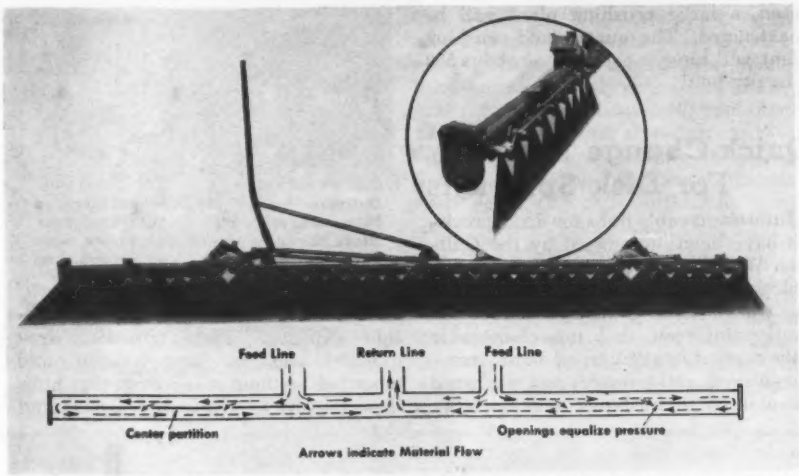
End-to-end circulation melts any slugs in the lines, and when nozzles are opened they all fire simultaneously; this results in straight-line starting and stopping and uniform distribution on the road, the company states.

The nozzles are directly attached to the bar with nozzle slots 1 inch from the bar, and milled at a fixed angle for a positive parallel fan pattern to eliminate overlap and puddling. A built-in self-cleaning disk-type shutoff valve is located at the fan slots to eliminate the danger of clogged or frozen orifices. The nozzle spring operating the disk also serves as a strainer, and the nozzle valves have tapered seats to provide sharp material cutoff.

With the new nonleaking 45-degree swing joints, end sections can be swung up for traveling without interfering with the full circulation of the bar. Whether an end section is up for traveling or in spraying position, no serious damage results from striking an obstruction because of the joint's swinging action when the obstruction is hit.

Bros Spraymatic bars are built with nozzles on either 4 or 6-inch centers and in all lengths up to 24 feet. Bars up to 12 feet are furnished with a 7-foot center section and right and left end sections. Bars over 12 feet long have flanged extensions bolted on. They are available for any make or model of distributor.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 199.

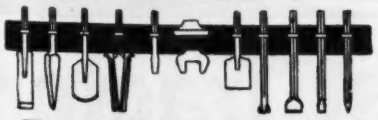


The Bros Spraymatic is built to handle heavy bitumen with no clogging and no drip. It is a 3-section full-circulating spraybar which fits all distributors.

Cooper President of NLGI

Howard Cooper, Manager of Technical Service of Sinclair Refining Co., N. Y., was elected President of the National Lubricating Grease Institute at the annual meeting of that organization in October. He has been associated with Sinclair since 1923, except for three and a half years of war service as Section Chief of the Marketing Division of the Petroleum Administration.

"BICKNELL BETTER BUILT"
PAVING BREAKER TOOLS



We manufacture a complete line of tools for pneumatic paving breakers, rock drills and diggers.
Write for descriptive circular
BICKNELL MANUFACTURING CO.
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BUILT TO Out-Perform!

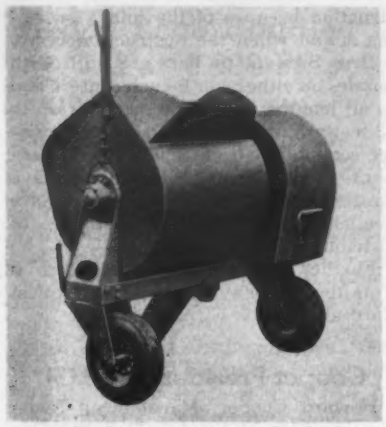
3/8 TO 40 CU. YDS.
A TYPE AND SIZE
FOR EVERY DIGGING PURPOSE

Combining rugged construction, larger capacity and perfect balance, HENDRIX DRAGLINE BUCKETS give smooth performance and low maintenance cost. These features mean BIGGER PROFITS to the users who have already switched to HENDRIX BUCKETS.

HENDRIX BUCKETS have proved themselves in the field . . . their performance and long-life prove Hendrix Buckets are tough! Repeat orders from all over the country prove HENDRIX BUCKETS ARE BEST . . . prove HENDRIX BUCKETS do out-perform!

HENDRIX Lightweight DRAGLINE BUCKETS

For descriptive literature ask your dealer or write
HENDRIX MANUFACTURING CO., Inc.
MANSFIELD — LOUISIANA



Kwik-Mix makes this 6-cubic-foot-capacity tilting plaster-mortar mixer.

New Tilting Mixer For Plaster, Mortar

A tilting plaster-mortar mixer of 6-cubic-foot capacity has been added to the line of concrete, bituminous, and plaster-mortar mixers manufactured by the Kwik-Mix Co., Port Washington, Wis. It features a semi-power tilt arrangement: through the action produced by the paddle-shaft drive, the loaded drum tends to tilt itself when released for discharge, according to the company. The drum also tilts in the opposite direction for quick, easy cleaning.

The new mixer is equipped with a single-cylinder air-cooled gasoline engine, and power is transmitted by multiple V-belts with enclosed reduction gears running in oil. Electric power is optional. Four nonclogging mixing blades, positioned at 90 degrees around the shaft for uniform action, are slotted for radial and longitudinal adjustment. Blades scour the drum on each revolution for end-to-end mixing and rapid discharge.

A 60-inch-wide wheel gage permits towing and the 32-inch length allows this tilter to clear standard door openings. Tipping is prevented by the push-down tow-pole arrangement.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 198.

A Wide-Berth Trailer For 50-Ton Structures

A 4-page folder describing the new Super-Hauler has been issued by Schuette Builders Co., Wausau, Wis. This unit is designed for loading, moving, and erecting houses, fabricated assemblies, large equipment components, and other awkward or cumbersome structures. It has a maximum length of 44 feet, a maximum width up to 22 feet, and a load capacity up to 50 tons. It can be built to any specification and can be assembled under the load.

The bulletin describes and illustrates the five basic trailer units and their application in loading assembly-line houses. The Super-Hauler may be used with any standard 3 to 5-ton truck and can be knocked down and placed in the truck for the return trip.

This literature may be secured from the company, or by using the Request Card at page 16. Circle No. 127.

Lone Star Plant in Texas

Construction has started on a new plant for the Lone Star Cement Corp. near Sweetwater, Nolan County, in the heart of the west-Texas area. It will be completed some time in 1951 and will have an annual productive capacity of between 5,000,000 and 6,000,000 sacks of Lone Star cements. Walsh Construction Co. and Gifford-Hill & Co., Inc., are general contractors on the job.

The plant will include storage, mill and machine-shop buildings, and a building for plant-management offices and a laboratory. Adjacent to the mill, where the limestone quarries are located, a large crushing plant will be constructed. The quarry and crushing plant will have a capacity of about 500 tons per hour.

Quick-Change Hubs For Disk Sprockets

Interchangeable hubs for disk sprockets have been announced by the Cullman Wheel Co., 1344-1354 Altgeld St., Chicago 14, Ill., as a new advance in the transmission industry. The company points out that interchangeable hubs carried in stock in all bore sizes—key-wayed, set-screwed, and packaged complete with bushings and assembly screws—save delivery time and alteration expense. Plate sprockets frequently can be interchanged and mounted without removing the hubs from the shaft. The hub design is said to guarantee a true-running assembly. The manufacturer claims that the Grip-Master hub assembly complete with plate sprocket is usually less expensive than a standard sprocket that has been bored to size, key-wayed, and set-screwed.

Cullman makes the Grip-Master, an interchangeable hub for disk sprockets. Place the plate on the hub, insert taper bushings, tighten the cab screws, and the assembly is complete.

To assemble the sprocket plate is placed on the hub, the taper bushings are inserted, Allen head cap screws are started, and the assembly is complete, ready for mounting on the shaft. Grip-Master is made of steel, and is bored, drilled, and split, ready to receive the plate sprocket.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 112.

Here is the New Yardstick for

Allis-Chalmers Model HD-2

Hydraulic Torque Converter Tract

● BIG AND RUGGED . . . 41,800 lb. of properly balanced weight . . . long, wide, sure-gripping tracks. Handles the toughest jobs in stride!

● POWERFUL . . . Newest, latest GM 2-Cycle Diesel Engine; Model 6-110. Plenty of POWER . . . for longer life, lower maintenance, increased production.

● HYDRAULIC TORQUE CONVERTER DRIVE that eliminates most gear shifting and keeps tractor working smoothly at higher average speeds.

● SIMPLE UNIT ASSEMBLY . . . major assemblies removed and repaired or replaced without removing adjacent parts.

● EXTENDED LUBRICATION PERIODS THROUGHOUT . . . plus 1,000-hour periods on truck wheels, track idlers and support rollers with A-C's POSITIVE SEAL.

● EVERY OPERATOR COMFORT . . . seat, platform, controls, visibility . . . hydraulic finger-tip steering, self-energizing brakes, practically no gear shifting.

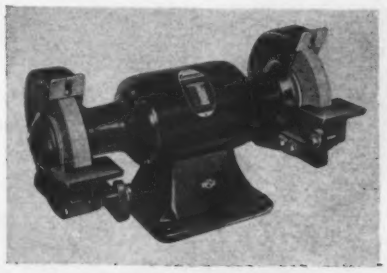
World's Finest Tractor

Get the full story from your Allis-Chalmers dealer. Arra
for a demonstration on your job at the earliest opportun

New Bench Grinders

Four new bench grinders for use in repair shops, garages, metal-working shops, and tool and maintenance shops have been introduced by Cummins Portable Tools, 4740 Ravenswood Ave., Chicago 40, Ill.

Model 470 has a 6-inch wheel with a ½-inch grinding width and a ½-inch arbor hole. It is powered by a ¼-hp motor. Model 471 has a 6-inch wheel with a ¾-inch grinding width and ½-inch arbor hole, and is driven by a ¼-hp motor. Model 475 has the same wheel dimensions but is powered by a ½-hp motor. Model 478, driven by a ¾-hp motor, has a wheel diameter of 8 inches, a grinding width of 1 inch, and a ⅝-inch arbor hole.



Four new bench grinders have been brought out by Cummins Portable Tools, with 6 to 8-inch wheels.

All motors are equipped with sealed ball bearings. The on-and-off toggle switch is mounted in the base. Removable guards give added convenience when using wire brushes and buffing wheels. Wheel speed is 3,440 rpm. Each unit is provided with an 8-foot cord.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 236.

In the Field for Nelson

In New York and New Jersey, Raymond C. Scheel and Herbert W. Scott, Jr., respectively, are now Field Engineers for the Nelson Stud Welding Division of Morton Gregory Corp., Lorain, Ohio.

Catalog on Hose Couplings

A bulletin describing the full line of Cleco couplings and other air-hose accessories has been offered by the Cleco Division of the Reed Roller Bit Co., P. O. Box 2119, Houston 1, Texas. Bulletin No. HF-747 illustrates and describes the company's line of pressure-seated air valves, air hose, grooved hose nipples, hose clamps, hose menders, blow guns, and miscellaneous accessories. Part sizes and numbers, descriptions, and specifications are included in the folder.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 237.

Crawler Tractor Performance

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

for Greater Production
for Easier Operation
for Simplified Servicing

Originator of the Torque Converter Tractor

Mississippi Bridge Nearing Completion

Structural Steel Set From River by Derrick Barge as Other Crews Place Concrete in Deck Slabs

(*Photo on page* 1)

✦ A STRUCTURAL erection stunt, different from that contemplated by the Minnesota Department of Highways, promises to finish the new Mississippi River bridge at Hastings ahead of schedule. By using a floating derrick from river level instead of a stiffleg derrick from above, the John F. Beasley Construction Co. of Muskogee, Okla., placed steel when the wind would have made erection from above impossible.

The substructure was built in the summer of 1949 by Industrial Contracting Co. (See C. & E. M., June, 1950, pg. 41.) Structural erection followed that work immediately, in spite of the windiest, rainiest spring anybody can remember in the town of Hastings.

Replacing the famous old spiral-approach structure which carried traffic for more than half a century, the new bridge is modern in every respect. It is a tied-arch design, 1,825 feet long, with a 32-foot roadway centered in the 40-foot overall width. A pedestrian walkway is on the east side of the roadway.

Floating Derrick Used

Plans had contemplated the usual erection procedure by top-mounted derricks, but the Beasley organization chose to erect all of the over-water steel with a floating derrick of its own design. The rig at one time had 185 feet of boom to lift the top truss members, and it always used more than 100 feet of boom.

Buoyancy was assured by demountable 10 x 20-foot pontoons, which were placed together to make a floating barge. Three heavy steel spuds, two at the bow and one at the stern, held the rig in position. Anchor lines went out when they were needed. The main hoist was a 4-drum American diesel-driven fluid-drive machine of a new and improved type. Frictions were air-operated.

The derrick barge was handled by a war-surplus Murray & Tregurtha Sea Mule, which had enough power to move the rig out in position until the spuds could be dropped by the hoist. Since the new bridge crossed a main navigation channel, the derrick barge had to be moved in each night and brought out again the next morning.

Structural erection began with the construction of 225-foot anchor arm spans, which were located on each shore. These arms were supported during erection by four sets of steel tower falsework, placed between the steel and the ground. A Manitowoc crawler crane, with a 100-foot boom, placed most of the anchor-arm steel from the bank.

C. & E. M. Photo

This floating rig, working from underneath the Hastings bridge, proved to be highly efficient on Beasley's steel-erection contract.

The 50-ton derrick boat then moved in on the north side and began to erect the top section of the cantilever truss. The steel members came out and were set in position, one by one, despite extremely unfavorable weather. High winds that caused experienced General Superintendent Dan Hewett to worry

(*Concluded on next page*)

For Construction Maintenance and Repairs

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Today's Best Bet For Leakproof Hose Connections

Write for Catalog and Air Leak Cost Chart

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When summer suns beat down, roads built with TARVIA* road tar are glare-free, easy on the eyes, and pleasant to ride on. They blend with any landscape, and do not wave, roll, push, or bleed. Self-healing, they stay smooth without constant care.

When winter's storms of snow and ice come, roads built with TARVIA road tar are more easily kept open for use, for their heat-absorbing black surface melts snow and ice. Moreover, TARVIA road tar is not affected by calcium chloride or sodium chloride.

Barrett's 46 years of experience in road building, maintenance and repair is yours for the asking. *Ask the Barrett field man.*

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Tires find a surer tread for safer driving on the slightly granular, "tractionized" surface of roads built with TARVIA road tar.

Barrett Tarvia* ROAD TAR

*Reg. U. S. Pat. Off.

made the riggers all the more anxious to hang on and take their chances.

"I had to order the derrick barge in several times, and every time it made the boys mad", said Hewett.

When the north half was erected to mid-point, the barge moved over and began to bring the south half out to the center. When the last piece of steel was in place, the top truss sections were within 5 inches of each other: very nearly within the calculated limits. Jacks were then used at each end. A lift was applied to bring the truss ends together, and they were made fast.

Installation of the steel hanger posts, floor beams, bottom laterals, and tie-chord members followed. The heaviest lift on the job was a 34-ton floor beam which was located at pier 7 and was placed with the north anchor arm. Exactly how these heavy pieces would be installed had been somewhat of an interesting job puzzle, but the derrick boat with its torque-converter hoist made the lifts quite easily.

When the steel work was finished, loading characteristics were checked by jacks and instruments which had been calibrated to no tolerance. Graceful, strong, beautiful, the steel made a beautiful line against the evening sky.

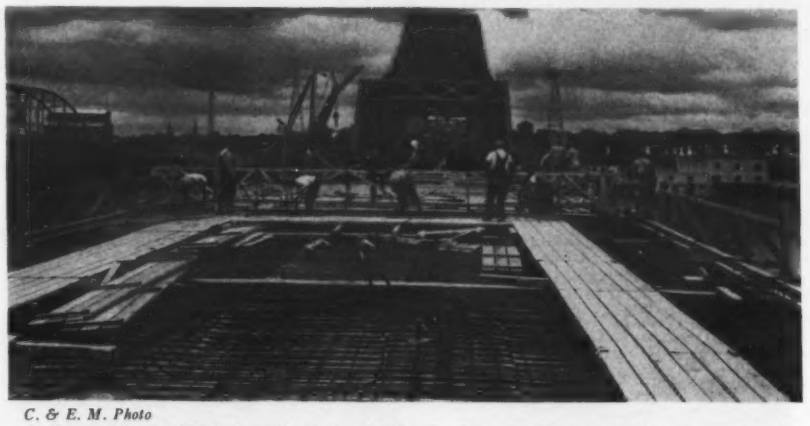
Deck Concrete Placed

Meanwhile, as rapidly as the Beasley organization could get the steel ready, concrete work in the deck was going ahead. Graus Construction Co., of Hastings, had that part of the bridge. With concrete land piers and painting and a few other items, the Graus contract totaled about $365,000.

With the exception of a little trouble maintaining the proper loading sequence at plate-girder spans, concrete paving was easy. At the plate-girder spans, however, an entire set of forms had to stay in place while the crew moved over and placed the adjacent pour.

Since most of the bottom formwork was not exposed to the public, it was faced with ordinary surfaced lumber. Dayton steel-wire hangers over the floor-beam flanges carried 2 x 12 joists, and the form facing was placed over these joists. Cantilevered wooden platforms below the formwork aided in the removal of forms after curing.

The concrete, an air-entrained mix, was furnished by Certified Concrete Co. of St. Paul. An average of 12 truck mixers made the 23-mile trip. The north half of the bridge was placed



C. & E. M. Photo

A shop-made mechanical strikeoff levels the freshly placed concrete on the Hastings bridge deck. Graus Construction Co. handled the concrete work on the project.

by 8 hand buggies, while a shore-based tower supplied concrete to the south half. When the south half was placed, Graus used 6 Bell Prime Movers and carts to make the haul.

After the buggies had dumped the concrete, and it had been shoveled out roughly and vibrated by the Master Electric stinger, a somewhat unique shop-built strikeoff screed went to work. It was built on a heavy steel frame, and consisted of a reciprocating strikeoff arm hung from the top by steel rods. A Wisconsin gasoline engine drove the strikeoff screed through a geared eccentric. The machine handled without trouble the 20-yard-an-hour rate of placement.

The deck slabs were then finished by long-handled wood floats, and cured by wet burlap. Later on, when a 50-foot section was complete, the curb and pedestrian sidewalk was placed.

Although Graus has until July, 1951, to complete the project, the organization expected most of the concrete work to be finished by the end of the 1950 season.

Personnel

Frank Cahill and Dan Hewett were General Superintendents respectively for Graus and Beasley. Howard Burkholder, Resident Engineer throughout the job, saw the new bridge through to its completion.

Accidents don't happen; they are caused. Remember: safety always pays.

RENT
these cost-reducing forms for concrete

Cost records from job after job prove that Economy's system of Form Engineering and Rental Service means substantial savings in TIME—MATERIAL—MONEY for GREATER PROFITS.

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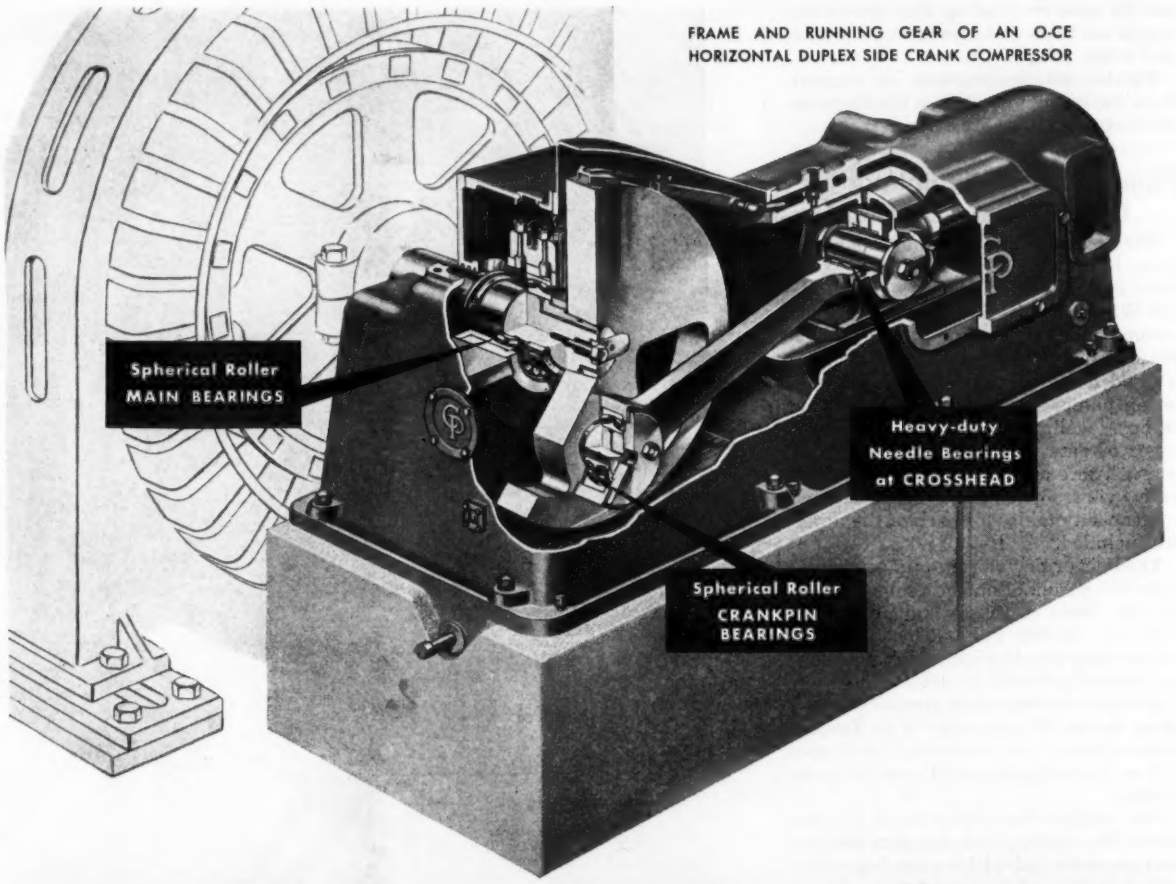
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Spherical Roller MAIN BEARINGS
Heavy-duty Needle Bearings at CROSSHEAD
Spherical Roller CRANKPIN BEARINGS

FIRST WITH ROLLER BEARINGS THROUGHOUT

IN A HORIZONTAL DUPLEX COMPRESSOR

- SPHERICAL ROLLER MAIN BEARINGS
- SPHERICAL ROLLER CRANKPIN BEARINGS
- HEAVY-DUTY NEEDLE BEARINGS AT CROSSHEAD

Chicago Pneumatic's Class O-CE AIR COMPRESSORS are the first horizontal duplex, side crank compressors to have anti-friction roller bearings throughout . . . spherical roller main and crankpin bearings . . . heavy-duty needle bearings at the crosshead pins.

To the user, "roller bearings throughout" means easier and cheaper maintenance, and no possibility of improper bearing adjustment with resultant serious damage to frame and running gear.

Roller crankpin bearings permit the use of solid-end connecting rods—the strongest, safest type.

This revolutionary innovation is made possible by the recent development of the oil injection method of bearing and crank disc installation and removal. This simple method, requiring only a hand-operated oil pump and ordinary hand tools, is employed also for the application or removal of gears, couplings and sleeves on shaft ends.

Class O-CE Motor-driven Compressors are furnished in sizes up to 2000 h.p.

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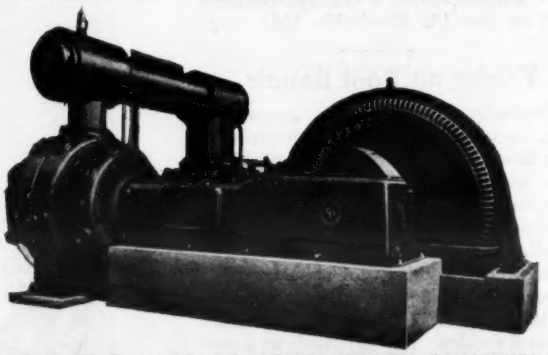

CLASS O-CE TWO-STAGE MOTOR-DRIVEN COMPRESSOR

CHICAGO PNEUMATIC TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

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Road-Form Handling With a New Machine

Pulling and handling road forms can be made easier with the new Nelson form-handling machine, according to Nelson Dowel Holder Co., South Cumberland, Lebanon, Tenn. The machine rides on the form and is adjustable between 18 and 25 feet. It can be made to run straight, upgrade or downgrade, around curves, forward or backward, without any attention by the operator, the company says. The Nelson automatic steering mechanism does the job. With this unit, forms can be handled from either side and loading can be done on the best side.

Automatic steering permits the operator to devote full time to the job of pulling the form. Brakes on the driveshaft will hold on steep grades and when pulling the forms. Pneumatic-tire trucks are provided and may be easily attached for inexpensive and fast transportation, the company says. Nothing need be dismantled in attaching these trucks. The machine will operate while on the pneumatic-tired units and can be used in loading and unloading trucks and cars and also for laying pipe and other jobs.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 123.

Pumps and Wellpointing Described in New Catalog

For detailed information on the complete line of Jaeger pumps and wellpoint systems, The Jaeger Machine Co., 550 W. Spring St., Columbus 16, Ohio, recommends its new pump catalog, No. P-10. This 48-page illustrated booklet is divided into sections covering dewatering pumps, pressure pumps, electric pumps, wellpoint systems, and five pages of data on water-transfer problems. There are many photos and cutaway views. Complete specifications and capacity tables for each of the units are included.

The Jaeger dewatering pumps, available in gasoline and diesel-powered models, have capacities ranging from 4,000 to 240,000 gph. The pressure pumps may also be obtained in gasoline and diesel-powered models, in sizes of 2 to 8 inches; they have pumping pressures up to 275 pounds. The Jaeger electric pumps are described as Sure-Prime centrifugals in 1½ to 10-inch models.

The engineering information at the end of the catalog includes data on the horsepower required for pumping various capacities of water, friction effects of water in 90-degree elbows, the theoretical discharge of water through nozzles, tables of effective nozzle streams, conversion of water quantities into various units, and a table of the loss of head by friction in pipes of various sizes.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 124.

Folder on Roof Repair

How to prolong the life of a roof and repair accidental damage is the subject of a new folder issued by Johns-Manville, 22 E. 40th St., New York 16, N. Y. The recommendations apply to commercial, industrial, and residential buildings.

The folder divides roof problems into three groups: (1) roofs that are starting to dry out; (2) roofs that are dried out and eroded; and (3) roofs and roof structures that are broken. So that the problem may be quickly classified there is a closeup of a typical roof in each group. With this is a picture showing how to prolong the life of such a roof. Other pictures show the difference in appearance and consistency of the repair materials Johns-Manville recommends—Regal roof coating, a smooth-bodied material; Asbestos Fibrous roof coating, a fibrous-bodied material; and Asbestos roof putty, a heavy-bodied material. The folder also discusses why roofs wear out; explains the principal ingredients used in roof savers and what each contributes; suggests applications; and includes data on container sizes, weights and coverage.

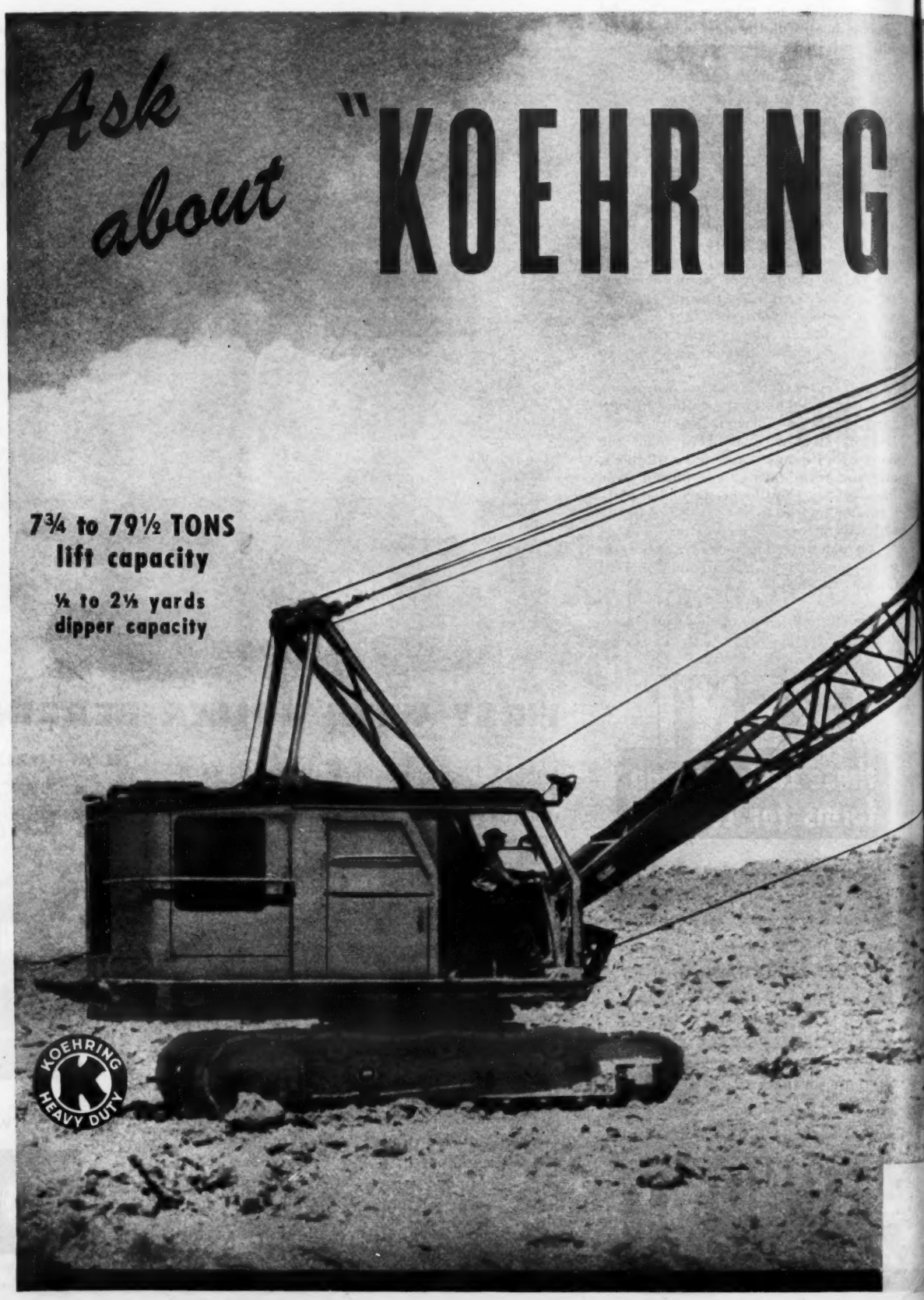
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 201.

The Nelson form-handling machine rides on the forms and runs upgrade or downgrade, and around curves. It is adjustable between 18 and 25 feet.

Snow-Loading Machine

An 8-page catalog illustrating snow-loading machinery is offered by N. P. Nelson Iron Works, Inc., Clifton, N. J. The two principal machines it describes are the Nelson KR-5 and R-10 snow loaders. These machines have capacities of 8 to 12 cubic yards of snow per minute and 10 to 20 cubic yards per minute, respectively. Specifications and illustrations are included. The folder points out that a Nelson bucket boom, available separately, enables conversion of the chassis into a bucket loader for handling sand, earth, gravel, or broken stone, thus making the unit a year-round machine.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 166.



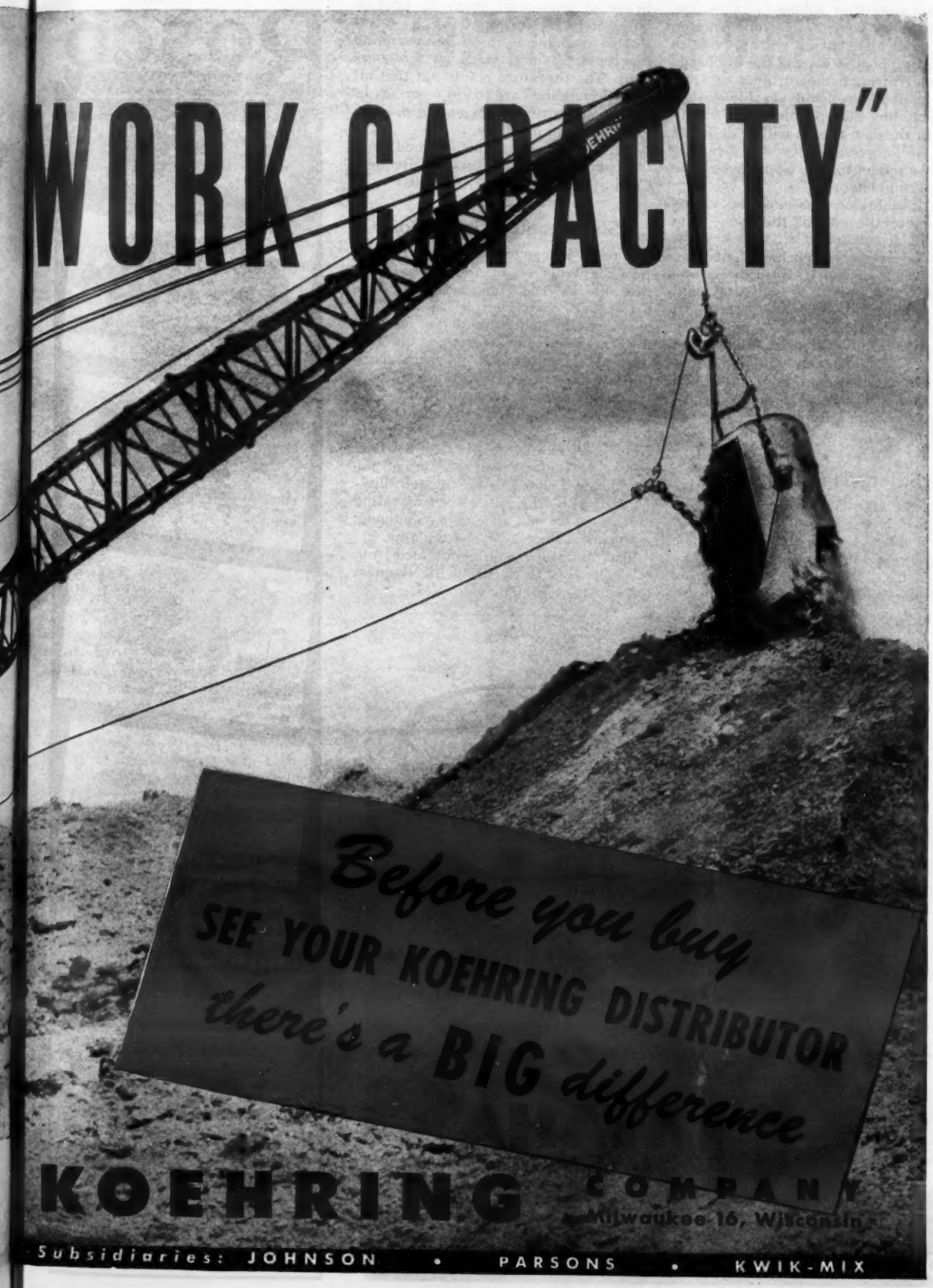
Massachusetts Has 5½-Mile Rubber Road

Massachusetts has recovered a 4-lane 5½-mile stretch of the Boston Post Road, from North Attleboro south to the Rhode Island state line, with a combination of asphalt, stone, and a new meltable rubber compound called Surfa-Sealz, developed by the United States Rubber Co. The rubber-asphalt combination was laid over an old patched concrete base at an approximate cost of $200,000. Highway officials expect it to wear well and to cut down maintenance costs, which were running as high as $1,000 per year per mile along that section of the highway.

Commissioner of Public Works William F. Callahan, who was present at the opening of the new road, said that for several years Massachusetts has been experimenting with rubber as a means of reducing heavy maintenance costs. The success of a ½-mile test section on route 1-A near Wrentham led to the adoption of the asphalt-stone-rubber combination used on the 5½-mile section.

Workmen pave a 5½-mile section of the Boston Post Road (U. S. 1) in Massachusetts with a stone, asphalt, and rubber compound. The old concrete surface is covered with a 1¼-inch layer of heavy stone, Surfa-Sealz rubber compound, and asphalt. The top 1¼-inch layer uses fine stone, rubber compound, and asphalt.

Governor Paul A. Dever has given the go-ahead signal for bids on a record $2,637,210 highway-resurfacing program in the state, and rubber compounds are to be used in eight projects under this program.



Level Convertible For Use as Transit

A low-price convertible level, wye level, and transit combined, with a detachable compass as an extra, is manufactured by Bostrom-Brady Mfg. Co., Stonewall and Bailey Sts., S. W., Atlanta, Ga. The No. 5 Bostrom level is designed for use where a semiprecise level is desired. It can be used in all climates.

It has a telescope with a magnifying power of 12 to 14 diameters. The cross on the target can be seen up to 1 mile, and the telescope has a minimum focus of 4 feet, the company says. The 4-inch horizontal circle is graduated to degrees and numbered in quadrants. It is movable so that angles may always be read from zero. The vernier on the horizontal limb reads to 5 minutes. The convertible level also has a vertical arc and index for reading vertical angles. The level vial is ground to a sensitiveness of 7 to 8 minutes.

For leveling work, the telescope rests in two wyes and is provided with a stop pin. This, in connection with the wye, is adjustable to insure a positive focus of cross hairs at all times, since the eyepiece system is stationary in the telescope. The instrument has a steel center and a three-point bearing 4 inches in diameter on the leveling plate. It has a shifting center for placing the plumb bob over a given point. The leveling plate is provided with four screws, and the leveling head has three cast points underneath to act as a trivet when the tripod is not being used.

A 5-foot tripod and a 9-foot extension leveling rod are provided with the unit. The rod is graduated in feet, inches, and eighths of an inch. It is self-reading and direct-reading on the face of the rod, and has self-computing ruler graduations on the side of the rod. The No. 5 Bostrom level may also be equipped with a detachable compass with a 3-inch jewel-mounted needle and lifter stop. A compass ring is graduated in ½ degrees.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 131.

Bulletin on Motor Oils

A new 44-page illustrated technical bulletin describing the properties and characteristics of Stanolube HD motor oil is offered by Standard Oil Co. (Indiana), 910 S. Michigan Ave., Chicago 80, Ill. The foreword to the booklet points out that Stanolube HD was developed to combat and control the fuel-soot and carbon deposits of the diesel engine, and the varnish and sludge deposits of the gasoline engine. The history of this development, the nature and significance of these heavy-duty problems, and the effectiveness of the oil in solving them are explained for the reader.

The bulletin outlines, among other things, the performance requirements of a heavy-duty motor oil, the difference between detergency and purging ability, performance test data on the company's products, and lubrication recommendations for equipment. Four-color unretouched photographs illustrate the comparative performance of Stanolube HD and other representative oils on various engine parts.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 153.

Hoist Company Moves

Gillis & Geoghegan Hoist Corp., which was formerly located in Brooklyn, N. Y., has moved its main offices and manufacturing facilities to Chicago, with offices located at 20 W. Jackson Blvd. The company was established in 1866 and its hoists are used for the handling of ashes, bags, barrels, machinery, etc.

Australian Dam Job Let to American Firm

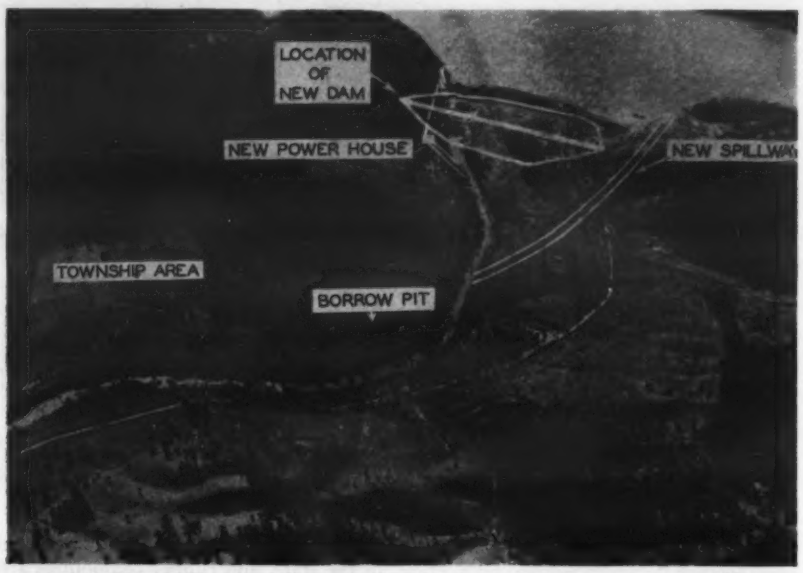
The contract for a new dam, the biggest contract ever let in Australia for a single construction job, has been awarded to the Utah Construction Co. of San Francisco, by the Victorian Water Supply Commission. Utah submitted the lowest bid, £11,360,000 ($25,560,000), on a cost-plus basis, with a construction fee of £450,000 ($1,012,500) and undertook to complete the work in the shortest time, 4 years and 36 weeks.

The dam will replace the present Eildon Dam on the Goulburn River, a Victorian tributary of the River Murray. More than half a mile long, with a rise of 260 feet above river level, the new earthen dam will contain the largest artificial storage basin in the southern hemisphere. Storage capacity will be 2,750,000 acre-feet, about nine times the present capacity of 306,000 acre-feet held by the existing wall.

Water from the reservoir will be discharged through hydroelectric turbines with a total capacity of 120,000 kw. Present output at Eildon is 16,000 kw. A subsidiary weir, 3 miles downstream from the main dam, will provide a regulating pool to control the discharge of water through the turbines.

A modern township capable of accommodating 4,000 people will be erected near the dam site. It will be designed with the long-range view of converting it into a model tourist center when the dam is completed.

Work at Eildon was expected to begin before the end of this year. The Utah Construction Co. has brought about 40 foremen, superintendents, and engineers from the U. S. to direct operations. The company will use plant and equipment estimated to cost £3,400,000 ($7,650,000). L. R. East, Chairman of the Victoria Rivers and Water Supply Commission, says that as much of this plant as possible will be obtained in Great Britain and Australia. A large proportion, however, will come from the U. S.



The Utah Construction Co. of San Francisco has been awarded a contract for the construction of a dam on the Goulburn River in Victoria, Australia. The location of the new dam in relation to the spillway, powerhouse, and township area is shown here.

Safety Tip on Slings

"Safety and Sense Save Pain and Expense" is the title of a pocket-sized card of safety tips on the care and use of wire-rope slings, prepared by Macwhyte Co., 2940 Fourteenth Ave., Kenosha, Wis. The card illustrates some of the precautions to be observed in using wire-rope slings to provide both safety and longer life.

Also available is literature describing the types of slings made by the company. The literature points out that all Macwhyte slings are made to order, in almost any sizes and types, to provide the maximum in safety.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 209.

Six-Wheelers in Action

A new 24-page fully illustrated booklet, "Six-Wheelers in Action", has been prepared by The Timken-Detroit Axle Co., Clark Ave., Detroit 32, Mich. It explains that new present-day uses for the 6 x 4 units may be grouped into two general classifications: to carry more gross vehicle weight, and to obtain better distribution of tire loads.

The catalog points to the spring performance of Timken-Detroit "Cradle Ride", and to other features of 6-wheel trucks. The principal portion of the booklet is devoted to on-the-job illustrations of 6-wheel units in excavating service, logging, machinery moving, material hauling, and road building.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 217.

Hydraulic Power Tools

A new condensed brochure on hydraulic power tools has been prepared by Watson-Stillman, Distributor Products Division, Roselle, N. J. The 12-page booklet gives complete information on Watson-Stillman jacks, pumps, benders, and shears. It illustrates the products and lists operating features, specifications, and applications.

Products covered in the catalog include independent-pump hydraulic jacks, ranging in capacity from 20 to 500 tons; heavy-duty self-contained hydraulic jacks, ranging in capacity up to 150 tons; single and double-plunger hand pumps; a double-acting air-engine pump for horizontal and vertical operation; portable pipe and conduit benders; and both hand and hydraulically operated shears for cutting wire rope, flat or round bars, and other shapes.

This literature may be obtained from the company by requesting Bulletin A-5, or by using the Request Card at page 16. Circle No. 118.

For Most EFFICIENT Snow Removal

USTRAC has it!

More and more aggressive communities are accepting the responsibility for the removal of treacherous snow and ice from heavily traveled areas. And, more and more communities are relying on rugged USTRAC to do the job because —

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Rated at more than 20 horsepower at drawbar.

USTRAC HAS THE VERSATILITY
Only 37 inches wide . . . ideal for sidewalks and narrow, confined areas.

USTRAC HAS THE MANEUVERABILITY
Instant reverse . . . no gears to shift . . . hydraulic controls instantaneous turning.

USTRAC GIVES MAXIMUM TRACTION
Crawler design means no slipping or sliding . . . no power loss.

USTRAC IS ECONOMICAL
Many report operation costs less than $1.50 per day.

USTRAC HAS THE ACCESSORIES
Efficient, one-man loader-dozer combination, heavy duty rubber track shoes that completely replace steel grousers, angle dozers, post hole diggers and many other accessories readily available.

Clark parts available

ASK TO SEE COLOR FILM OF USTRAC IN ACTION

SOME DEALERSHIPS STILL OPEN!

USTRAC AROUND THE WORLD — WRITE FOR DATA

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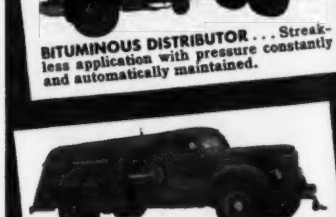
DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

ROSCO MINNEAPOLIS

ROAD and STREET CONSTRUCTION and MAINTENANCE EQUIPMENT



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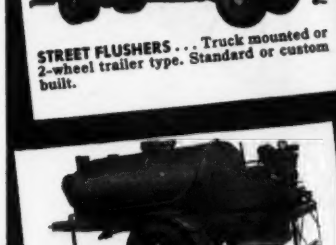

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STREET CLEANER . . . Settles dust as it cleans. Sweeps and washes the street.

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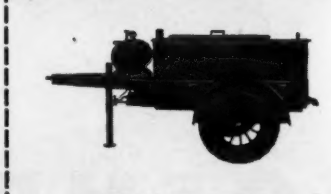

ROSCO TAR KETTLE
For heating and melting asphalt, pitch and all types of bituminous materials. Welded all-steel construction.

Sodding Contractor Contends With Hogs

They Root Into Slopes and Shoulders Newly Grassed; Unique Sod-Cuttting Tool Speeds Louisiana Highway Job

♦ "ROOT, hog, or die"—that terse ultimatum by which early American farmers consigned their swine to the task of digging up their own food—made the pigs self-reliant and self-sufficient. It makes S. T. Wall, sodding contractor of West Monroe, La., see several different shades of color—all of them red.

Wall is considered the largest sodding contractor in the state of Louisiana, where open range for livestock still obtains. Most states in the south have abolished open-range grazing. In parts of Louisiana, however, stock are still permitted to roam where they will, unfettered by fences. Naturally, the freshly grassed and sodded slopes and shoulders of a highway are a gustatory delight to all four-footed domestic animals seeking their own sustenance.

Sundry cows, sheep, goats, mules, and horses do not bother Wall. Such stock merely graze, nipping the grass before it grows too high. It's the hogs that arouse the contractor's ire. Piney-woods rooters, as these hogs are called in the Deep South, root for food along the highways, digging holes with their long snouts into the newly sodded slopes and shoulders. Foraging is considerably better there than in the pine woods where they are quick to scamper for shelter if molested. Piney-woods rooters have no respect for the costly and painstaking work of the contractor in beautifying the highway.

S. T. Wall recently completed a roadside-development subcontract along a 9.6-mile relocation project on U. S. 71, known as the Colfax Cutoff, between Alexandria and Shrevesport. T. L. James & Co. of Ruston, La., held a $1,147,145 prime contract which included the laying of a 9-6-9-inch reinforced-concrete pavement 24 feet wide. Paving was completed by the end of last year. Shoulders are 9 feet wide, while the slopes in cuts and fills are chiefly 3 to 1.

Roadside-Development Subcontract

The S. T. Wall subcontract, totaling about $85,000 worth of work, included the placing of approximately 126,000 square yards of block or slab sod and 32,000 cubic yards of mulch sod. Mulch sod was placed on the shoulders and front slopes, while the slab sod went in the ditches and on the backslopes. Sodding started in June, 1949, and continued intermittently until the fall. Work was suspended through the winter rainy season, but was resumed again last April. By May the roadside-development features of the highway were completed. Actually all the sodding could have been done in two months of consecutive work, but the sodding, of course, followed along after the grading and shaping of the shoulders and slopes.

Mulch sodding is cheaper than slab sodding. In mulch sodding, topsoil is dug out of fields and spread over the shoulders and front slopes by machines. In slab sodding, strips of sod are carefully cut from selected ground, hauled to the road, and placed by hand to form a smooth, continuous carpet of green grass. For both types of sodding the roadside was prepared in advance by first scarifying the ground. This was done with farm-type equipment, a tiller being used where the soil was hard, and a spike-tooth harrow in soft ground.

In both cases the ground was then similarly fertilized with a 6-10-4 mix of commercial fertilizer, applied at the rate of 800 pounds to the acre. About 600 sacks were required for the job. It was furnished by Arcadia Cotton Oil Co. of Arcadia, La., and distributed from a Ford fertilizer distributor.

C. & E. M. Photo

For your information, these are piney-woods rooters, making life hell for sodding contractor S. T. Wall of West Monroe, La. The long snouts of these self-reliant foragers play havoc with his neat new roadsides.

Mulch Sod

Rich topsoil for the mulch sodding was obtained from various farmers'

(*Continued on next page*)

AMERICAN
Deluxe Concrete
WHEELBARROW

Code PERFECT
15 Gauge seamless tray

The American Steel Scraper Co.
SIDNEY OHIO

THRIVING ON A DIET OF MUD AND WATER

U. S. Rubber Hose does a multitude of jobs from dredging to de-barking trees

ALL-DAY SUCKER describes hose built by U. S. Rubber to meet the severe requirements of sand suction service. Each length is custom-made to take the strong vacuum needed to draw bulky wet sand, muck, coral and rock. A tough rubber tube counteracts their terrific cutting action. Wire reinforcement prevents collapse under extreme suction and constant shifting action.

WATER SUCTION AND DISCHARGE HOSE by "U. S." can readily be rounded out, if crushed or flattened in service. It is lighter in weight than ordinary constructions, yet it is remarkably flexible and durable. When the operating conditions are unusual, "U. S." engineers design a construction to meet them.

RAZOR OF WATER! At a pressure of 1400 lbs. per sq. in., the 2 jets of water spurt from special U. S. Rubber hoses on this de-barking machine, can strip a 20-ft. log in 30 seconds. So great is the pressure on this hose that if the to-and-fro movement of the nozzles were slowed down, holes would be bored in the log.

The research and design staff of United States Rubber Company is always at your disposal when you have a question about hose. They know the latest developments in the hose field, new techniques, new methods, new economies. They can make hose do many things it has never done before, are constantly developing hose that meets new standards in efficiency, durability and safety. Write:

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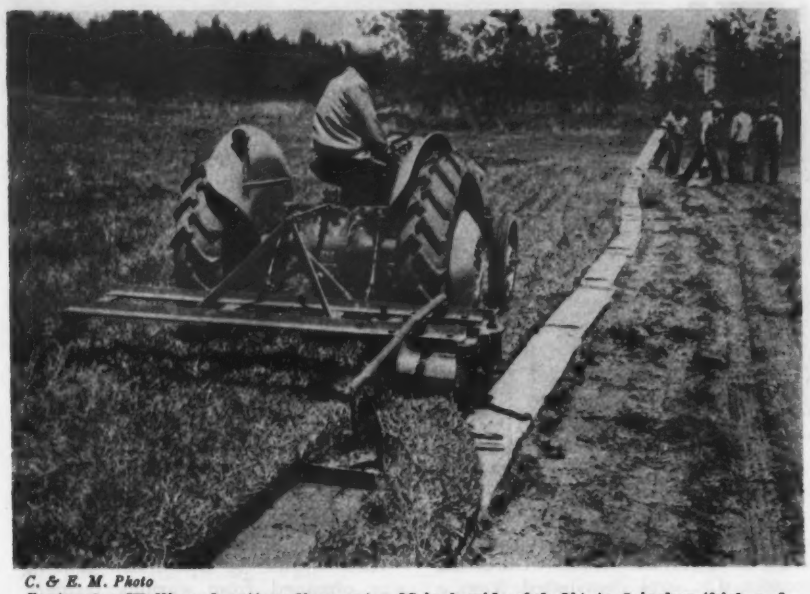

C. & E. M. Photo
Contractor Wall's sod cutter slices out a 13-inch-wide slab 2¼ to 3 inches thick and diverts it onto boards laid in a straight line down the field.

C. & E. M. Photo
Note the spool-shaped roller which marks out a strip of sod for cutting, the flat blade, and the turning slide connected to the cutter with a swivel bolt.

Sodding Contractor Contends With Hogs

(Continued from preceding page)

fields in the vicinity of the project, requiring not more than a 2-mile average haul. It was dug out by both a Caterpillar elevating grader and a Northwest 25 dragline equipped with a 40-foot boom and a Hendrix 1-yard bucket. The excavation was a stripping process to an average depth of only 6 inches. Material was hauled in a large fleet of trucks which included 16 Ford F6's, owned by the contractor and holding 5 yards, and from 10 to 15 other trucks that were rented by Wall as needed.

The mixed grass and dirt was end-dumped on the shoulders, and spread to a uniform depth of 4 inches by an International TD-14 and a Caterpillar D6 tractor-dozer, and shaped by a Caterpillar No. 12 motor grader. Then the mulch sod was rolled by 1,200-pound Culti-Packers pulled either by rubber-tired tractors or mule teams working in strips parallel to the pavement. The rolling broke up any large clods of dirt and left a smooth, even surface.

When necessary the mulch sod was wet down with water from a pair of 1,000-gallon tank trucks which rolled along the highway. The water was sprayed on from a hose with pressure furnished by a 2-inch pump carried on the truck. Almost all of the slopes were reached from the road in this way. Within only a few days in the warm, moist Louisiana climate, the mulch sod turned green, taking on new life.

Slab Sod

Slab sod was obtained by purchasing it "on the ground" from selected farmers' fields and pastures that were fairly flat so that the sod might be easily picked up. The picking up was done with a sod-cutting machine developed by S. T. Wall, the contractor, and mounted at the rear of a Ford rubber-tired tractor. Mounted on a steel framework 6 feet wide, the cutting machine is raised and lowered hydraulically. This smooth-working tool has three principal parts overhanging the side of

(Concluded on next page)

SNOW-REM
SNOW PLOW WAX
Carnauba and SILICONE
Makes snow removal faster, easier, cheaper.

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7300 ASSOCIATE AVE. • CLEVELAND 9, OHIO

MORE for your MONEY!

Weighs 6000 pounds with liquid in tires
Big 42½ H.P. engine
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HUBER MAINTAINER-

9 MAINTENANCE MACHINES IN 1

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2. HIGHWAY MOWER
3. BERM LEVELER
4. ROAD PLANER
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6. LIFT LOADER
7. ONE-WAY BROOM
8. PATCH ROLLER
9. SNOW PLOW

HUBER MFG. COMPANY
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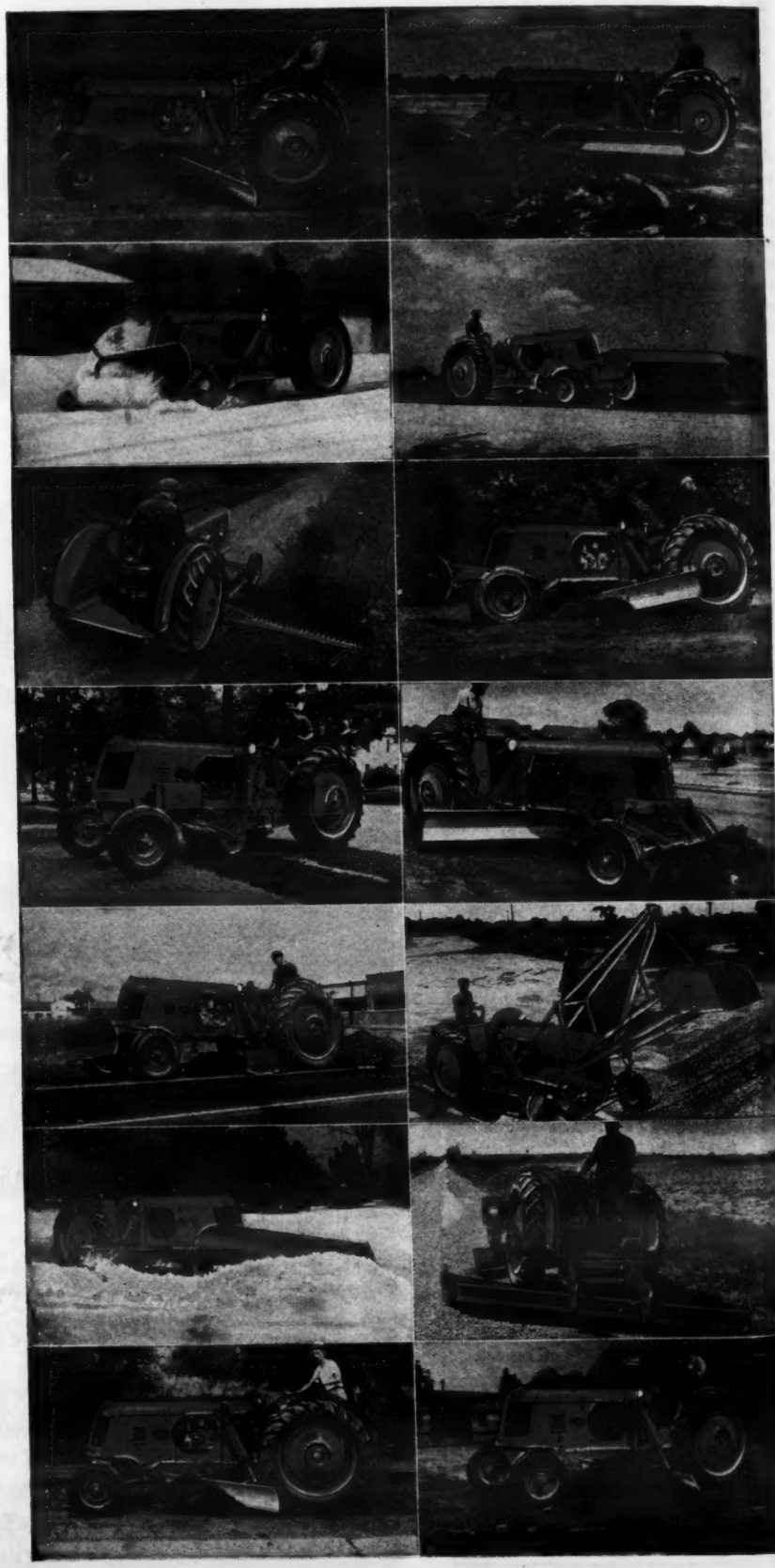
See your nearest HUBER Distributor for Maintainers, Rollers and other Road Machinery.



the tractor. In front is a heavy metal roller, filled with concrete to give it weight, 13 inches wide x 10 inches in diameter. It is shaped like a spool with sharp cutting edges, 2½ inches deep, at the ends. The roller compresses the grass in running over the field, while the sharp edges mark out a strip for cutting 13 inches wide.

Immediately behind the roller is the sod cutter, a flat edged blade also 13 inches wide with a length of 6 inches. This blade cuts the strip of sod to the desired thickness which, in this case, is from 2½ to 3 inches. By adjusting the blade, sod may be cut to a depth of 12 inches with this plow-like cutter.

To the rear of the flat cutter and connected to it with a swivel bolt is the turning slide, the third essential part of the machine. By eliminating a rigid connection between the cutter and slide, Wall does away with any piling up of the sod strips, and keeps the machine flowing freely. A steel partition, on a 30-degree angle with the edge of the slide, diverts the strip of cut sod off the machine and onto boards laid in a straight line down the field. The boards are 12 inches wide, one inch less in width than the strip of sod; thus they are easily laid in the 13-inch slot which is formed when the sod is cut and stripped.

A small metal shelf at the side of the slide rides over the edge of the row of boards, and insures the sod slipping neatly from the machine to the boards. These boards are cut in 7-foot lengths. A man walks along behind the machine with a chopper and cuts the sod into 7-foot strips so that each board may be picked up separately with its individual section of sod.

Placed by Hand

From 60 to 100 boards, each holding a strip of sod 7 feet long, are loaded on flatbed trucks. In wet weather the load is usually 60 boards, while 100 may be carried when the sod is dry. As soon as a strip of sod has been cut out of the ground and the boards loaded on the truck, other boards are laid in the newly opened slot and another strip is cut and loaded. With the overhang on the cutting machine, the tractor never runs over the strip about to be cut. With the slab sod the average haul from field to job was 6 miles, or three times as far as the haul with the mulch sod.

While sod cutting with power machines is customary on big jobs, contractor Wall feels that the turning slide on his plow-like tool eliminates eight laborers who would be required to lift the sod onto the boards. He is also planning a machine that will load the sod strips directly onto trucks, thus making possible still further economies in roadside development.

On the already fertilized and prepared ground of the ditches and backslopes, the sod was placed by hand. This was expertly done by a trained crew of men. The boards holding the sod strips were handed down to two men on the ground who seized the ends. With a quick flip the sod was slipped cleanly off and into place on the ground in parallel rows. The boards were stacked back on the truck for the return trip after more sod.

The slab-sodded areas were then rolled with a cylindrical roller pulled either by mules or tractor. The roller consisted of a 6-foot section of 3-foot-diameter iron pipe, plugged at the ends and filled with water so that it weighed 1,500 pounds. This rolling did away with the laborious hand tamping usually associated with slab sodding. The sod was also watered.

C. & E. M. Photo

Boards holding the sod arrive on trucks at the job site of the S. T. Wall roadside-development subcontract on U. S. 71 in Louisiana. Immediately after delivery the sod is slipped off and into place on the ground in parallel rows.

Personnel

During all the sodding operations, the roadside contractor was continually bedeviled by the piney-woods rooters, forcing their long snouts into the trim, neat slopes and shoulders. As they passed they left a maze of deep, irregular holes that had to be filled and repaired before the terms of the contract were fulfilled and the new highway officially accepted.

S. T. Wall of West Monroe, La., gave the sodding subcontract his personal supervision with the assistance of W H. Barnes, his superintendent. The work force averaged 75.

T. L. James & Co. was represented by J. B. Reed, Superintendent.

For the Louisiana Department of Highways, W. D. Gibson was Project Engineer. Torbert L. Slack is Landscape Engineer in charge of the roadside-development work. The Department is headed by R. B. Richardson, Director. N. E. Lant is Chief Engineer, and W. J. Hughes is Construction Engineer.

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Portland 9
Seattle 4

Matched-facing sets of clutch plates are made by S. K. Wellman for extra-heavy-duty trucks and tractors.

Matched All-Metal Clutch-Plate Line

A new line of matched-facing clutch-plate sets for extra-heavy-duty trucks, tractors, and industrial equipment has been added by The S. K. Wellman Co., 1374 E. 51st St., Cleveland 3, Ohio, manufacturer of Velvetouch all-metal friction products. Each set consists of an all-metal Velvetouch clutch plate, and two all-metal friction facings for mounting on the flywheel and pressure plates. In this way, the operator gains the full advantage of friction-to-friction performance, for the clutch plate operates against matching Velvetouch friction surfaces, instead of against the cast-iron faces of the opposing plates, Wellman points out.

Velvetouch matched-set installations provide long clutch life, few adjustments, great holding power, and the elimination of surface wear on both opposing plates, the company says. In addition, the matched facings permit badly worn and heat-checked flywheels and pressure plates to be re-used.

Velvetouch is made from powdered metals, formed under great pressures, and fused with a solid steel backing. No organic substance or binders of any kind are used; as a result, Velvetouch won't glaze in oil, or burn. The mixture of different powdered metals minimizes chattering and slipping, Wellman says. Matched-facing sets also run cooler, since the all-metal construction carries the heat away from the wear surface.

Installation is as follows: Machine down the wear surfaces of the flywheel and pressure plates, follow the rivet pattern for drilling, and rivet the facings in place. The Velvetouch clutch plate installs in the regular manner.

An illustrated folder describing Velvetouch matched-facing sets may be secured from the company. Or use the Request Card at page 16. Circle No. 149.

Quarterly Booklet On Equipment Care

"Service Reporter" is the title of a new publication being released by Caterpillar Tractor Co., Peoria 8, Ill. Written informally in language easy to understand, its aim is to provide helpful hints and basic information on how to keep Caterpillar equipment in good working condition.

For the present it will be issued four times a year—October, January, April, and July—with varied and timely subjects.

Circulation of "Service Reporter" will be through Caterpillar dealers.

Engineer Will Promote Asphalt for Reclamation

Cecil E. Rhodes is in charge on a national scale of the Asphalt Institute's special studies dealing with asphalt uses in reclamation projects such as dam facings, erosion control, and linings for canals, reservoirs, and ponds. He succeeds Walter F. Winters, recently promoted to the post of Chief Engineer, as the Institute's Special Projects District Engineer with offices in the Cobb-Stebbins Bldg., 1250 Stout St., Denver, Colo.

Subsoil Investigations

Catalog B-2, "Subsoil Investigations for Foundations", prepared by the Gow Division of Raymond Concrete Pile Co., 140 Cedar St., New York 6, N. Y., outlines the company's experience and services in soil-examination work. It provides a history of the organization and includes recommended procedure and practice followed in site exploration with standard Gow boring techniques. It treats in detail the reason for subsoil investigations, the manner in which they are performed, and the results which may be obtained from them. A number of field photographs illustrate the equipment used in this work.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 188.

ALABAMA PIPE COMPANY

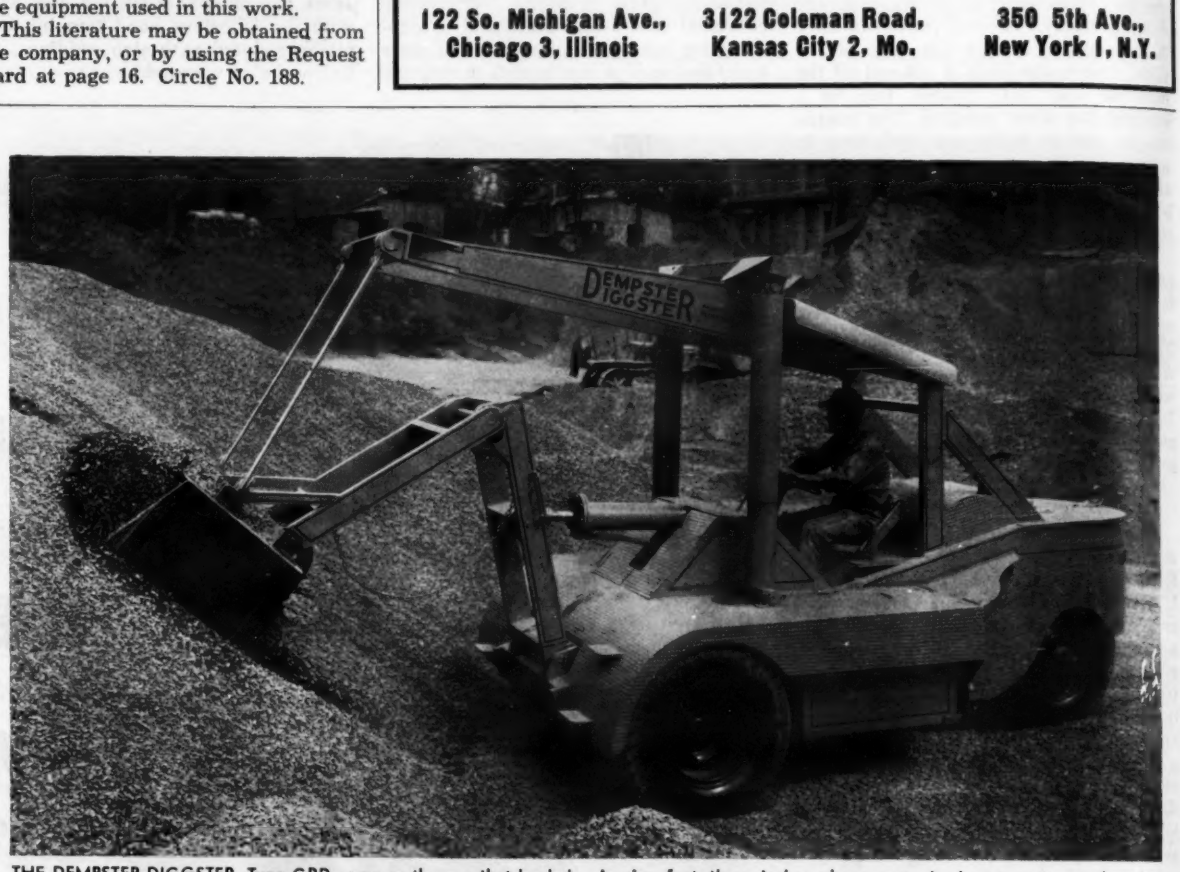
General Sales Offices

ANNISTON, ALABAMA

Takes pride in announcing the resumption of pressure pipe manufacture at its recently completed modern plant located at Anniston, Alabama. This plant produces Super deLavaud cast iron pipe, centrifugally, in modern long lengths.

Inquiries addressed to our nearest sales offices will be appreciated

122 So. Michigan Ave., Chicago 3, Illinois | **3122 Coleman Road, Kansas City 2, Mo.** | **350 5th Ave., New York 1, N.Y.**



THE DEMPSTER-DIGGSTER, Type GRD, same as the one that loaded 600 tons of stone recently, has a 15 foot six inch turning radius, is 20 feet long when bucket is in traveling position, and bottom of bucket is nine feet three inches above ground when in extreme dumping position. It will dig 15 inches below grade and through a 15 foot bank. Note how bucket follows the slope of the material.

THIS DEMPSTER-DIGGSTER, Type HL, is specially equipped for high dumping. The bottom of the bucket is 13 feet six inches above ground. It will dig through an 18 foot bank.

FOR FAST, EFFICIENT operation in difficult terrain, the Dempster-Diggster is available with crawler-type traction.

Fast Automotive Shovel Loads 600 Tons of Stone in Half a Day

CONTRACTOR REPORTS: HYDRAULIC CROWD, HOIST UNIT "FILLS LONG NEEDED PLACE IN OUR INDUSTRY"

THE DEMPSTER-DIGGSTER, a revolutionary shovel loader, recently loaded 600 tons of broken stone in the first half day of operation. This outstanding performance was reported to Dempster Brothers, Inc. by W. E. Lambert, president of Lambert Brothers, Inc., one of the nation's largest crushed stone contracting firms.

"In connection with our extensive activities in several southern states," the contractor said, "we have used various types of power shovels and front end loaders. After seeing the easy operation of the hydraulically operated Diggster in a demonstration we had made alongside of a competing loader, we placed an order with you. We installed the Diggster equipped with a yard and half stockpile bucket on one of our operations in western North Carolina.

"Our records show," he continued, "that the unit loaded approximately 600 tons of broken stone in the first half day of operation. The Diggster has been working continuously and is giving perfect satisfaction. It is a pleasure for us to so advise you because in our opinion the Diggster fills a long needed place in our industry. We welcome you to bring any interested parties to our operation to see the Diggster in action."

The tremendous speed of the Dempster-Diggster in excavation and stockpile work is accounted for, mainly, by its exclusive independent hydraulic crowd and hoist action, the hydraulic steering, and wheel-type traction, which permits truck speeds to and from jobs. The power crowd permits bucket to keep digging until loaded . . . no digging with wheels. The hydraulic steering gives the driver easy, fast, finger-tip control.

Four standard interchangeable buckets of two types are available. Digging buckets with four bottom teeth in 1 and 1¼ cubic yard (heaped) capacities; materials handling buckets in 1½ and 2 cubic yard (struck) capacities.

Complete information and prices may be obtained by writing the manufacturer, Dempster Brothers, Inc.

DEMPSTER DIGGSTER

DEMPSTER BROTHERS

4120 Shea Bldg.

Knoxville 17 **Tennessee**

Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Sewer Pipes Collapse Because Bracing Poor

THE PROBLEM: *Due to soil conditions not shown by municipal sewer plans and specifications, it became necessary to stabilize the trench at certain stations of the line. The city engineer said it was the contractor's duty to provide the necessary cradling, and recommended concrete cradles. But the contractor used wooden boards. These braced the pipes insufficiently and some of them collapsed. The city had another contractor make the necessary repairs at a cost of $13,588.45. Did it have a right to deduct that amount from the balance due the first contractor?*

THE ANSWER: Yes. (Brasher v. City of Alexandria, La., 41 So. 2d 819, decided by the Louisiana Supreme Court.)

The trial court allowed judgment in favor of the contractor, and on the original hearing of the city's appeal the judgment was upheld by the Supreme Court on the ground that the contractor fulfilled his contract by laying the sewer according to plans and specifications. But on a rehearing of the case, the Supreme Court reversed itself and ordered the suit dismissed for these reasons:

The contract required the contractor to furnish all labor and material necessary to complete the sewer and, before final acceptance of the work, to "correct any deficiencies existing in the sewers, manholes, or other appurtenances, and put the entire system in working condition."

When the work was finally accepted, the city reserved its claim against the contractor on account of the collapse of the sewer sections.

The general rule recognized by the courts is that a contractor is liable for destruction of his work before complete, although he has followed the plans and specifications, unless the owner explicitly or impliedly warrants the sufficiency of the plans furnished by him.

Although the city had the benefit of expert engineering advice, the contractor was an expert in laying sewers, and the city did not guarantee or misrepresent soil conditions. It did not appear that the city knew actual conditions.

When the soil conditions were discovered, the contractor knew as well as the city's engineers how the trench bottom should be stabilized.

The Supreme Court makes extended reference to decisions reached by different courts in similar cases.

No Increased Pay Granted Under Government Contract

THE PROBLEM: *A housing-project contract during World War II provided for increase of contract prices should taxes or other charges be imposed by Congress after the date of the contract. Was the contractor therefore entitled to additional compensation (1) on account of a subsequent executive order which extended a work week from 40 to 48 hours, with time and a half pay in excess of 40 hours, and (2) on account of increased construction cost due to the Government's subsequently adopted system of priorities as to materials?*

THE ANSWER: No, said the United States Court of Claims. (Clemmer Construction Co. v. United States, 71 Fed. Supp. 917.)

The court upheld the Government's contentions that it was not responsible for harm resulting to contractors from acts performed in the Government's sovereign capacity, as distinguished from its contracting capacity; and that an executive order fixing a new minimum work week did not constitute a tax or charge imposed by Congress, within the contract clause mentioned in the first paragraph of this item.

"As to the priorities question," added the court, "we think that the additional cost of . . . finding a dealer who had materials which he could sell on the priority which the customer held would be much too indirect and indefinite an additional cost to come within the quoted section of the contract. We think the section applied only to definite, fixed, and directly applicable legal charges."

Excess Profits on War Jobs

THE PROBLEM: *Four days before Congress passed a law providing for the renegotiation (revision) of Government contracts involving excessive profits, the War Department let contracts for buildings at an army camp. The contract contained no provision for renegotiation. After the statute took effect the Government paid the full contract price. Could the Government thereafter reclaim part of the price paid in proceedings under the Renegotiation Act above mentioned?*

THE ANSWER: Yes. (Ring Construction Co. v. Secretary of War, 178 Fed. 2d 714, decided by the United States Court of Appeals, District of Columbia.)

The court rejected argument by the contractor's attorneys that it was unconstitutional to permit the Government to reclaim part of what it had paid as an agreed contract price. The court said: "To reprice war contracts under legislative authority is not . . . to abrogate them, nor to take from the contractor a property right in violation of the" Constitution. As stated by the United States Supreme Court, "the recovery by the Government of excessive profits received or receivable upon war contracts is in the nature of the regulation of maximum prices under war contracts or the collection of excess-profits taxes, rather than the requisitioning or condemnation of private property for public use."

The court recognized that "it is ordinarily true . . . that the United States is so bound

(*Concluded on next page*)

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here's why you're ahead with the BIG RED team

☆ **It's matched for championship dirt moving**

The BIG RED team combines the outstanding crawler tractor with the outstanding scraper: Bucyrus-Erie B-170 (15 yd. struck) or B-250 (22 yd. struck) scraper working behind an INTERNATIONAL TD-24 tractor.

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The BIG RED team is bigger, easier to handle, does things no other tractor-scraper combination can do.

☆ **It makes crawler hauling pay**

The BIG RED team extends the profitable limits of crawler tractor hauling, outperforms rubber-tired outfits on much longer hauls than has generally been accepted.

☆ **It works more days per year**

The BIG RED team stays on the job under conditions that stop rubber-tired equipment — bad weather, wet fills, wet and slippery haul roads.

☆ **It's backed by the best in the business**

The world's largest and oldest manufacturer of earthmoving equipment builds the scraper; the largest company manufacturing tractors builds the TD-24; both tractor and scraper are sold and serviced by International Industrial Tractor distributors everywhere. See the one nearest you for full details.

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South Milwaukee, Wisconsin

BUCYRUS ERIE

See Your INTERNATIONAL Industrial Tractor Distributor

Avoid Legal Pitfalls

(*Continued from preceding page*)

by its contracts that it cannot later legislatively impair or repudiate them. But that is not an inflexible rule, as national crises may justify exceptions."

Personal Injury Cases—Amounts Fairly Allowed

THE PROBLEM: *Through careless driving of an automobile by a civilian employee of the United States Quartermaster Corps, a construction superintendent and foreman riding in another car were seriously injured. Considering the nature of the injuries sustained by each, the medical expense and loss of time summarized below, was an award against the Federal government of $45,000 damages in favor of the superintendent and $60,000 in favor of the foreman equitable?*

THE ANSWER: Yes. (Wibye v. United States, 87 Fed. Supp. 830, decided by the United States District Court, Northern District of California.)

The superintendent (40 years old) sustained cerebral concussion, involving loss of vision of one eye, nervous shock, and painful lacerations and abrasions. He lost $17,625 in wages while disabled, at $125 weekly, and spent more than $2,000 for medical and hospital treatment. The award included estimated future loss of earnings, based upon his life expectancy.

The foreman (41 years old) sustained fractures of both hips and a knee, in addition to injuries similar to those suffered by the superintendent, and $14,000 accrued loss of wages as well as future loss of earnings, plus $4,500 expense for medical treatment and hospitalization.

Federal Wartime Control Over State Highway Jobs

THE PROBLEM: *During World War II were state highway contractors discharged from duty to perform their contracts by a stop order issued by the War Production Board?*

THE ANSWER: Yes. (Stamey v. State Highway Commission, 76 Fed. Supp. 946, decided by the United States District Court, District of Kansas.)

First, the court noted that there was a Federal statute explicitly stating that no one should be held liable in damages or penalties for default under a contract resulting from compliance with any order of the Board. Then the court said:

"The performance of the contract was impossible under the stop order of an authorized governmental agency and the parties were thereby discharged from its performance. (See Edward Maurer Co. v. Tubeless Tire Co., 6 Cir., 285 F. 713, affirming, D.C., 272 F. 990.) Even in the absence of a statutory provision releasing the parties from liability for failure to perform contracts because of conditions of war there is sound reason to release the parties from the bargain under such circumstances if the parties may be materially affected thereby so as to increase or decrease the obligation of the parties. Parties to a contract are not liable for failure to perform where a subsequent enactment or change of the law makes its performance unlawful."

Right to Sue in Another State on Road-Job Bond

THE PROBLEMS: *(1) Did state highway contractor's bond to secure performance of the contract benefit those furnishing labor or materials for the job? (2) Was a bond given under Connecticut statutes, to secure payment of such claims growing out of highway construction in that state, enforceable by suit in New York?*

THE ANSWERS: No. (Long v. Ferris, 94 N. Y. Supp. 2d 493, decided by the New York City Court, New York County.)

The court decided that although the first bond did not cover labor and material claims, the second did; but that since the second bond had been given to comply with a Connecticut statute governing work done in that state, it was subject to a provision of the statute that suit on such a bond should be brought in the superior court of the county where the contract was to be performed.

Extra in Floor Pour

THE PROBLEM: *Plans for the floor of a dam operating house indicated that it could be constructed by one pouring of concrete. The Resident Engineer and Contracting Officer representing the Government assented to this interpretation of the plans by the contractors. But when the pour was all ready to be made, the Contracting Officer as District Engineer ruled that a recess must be left around a slot in the floor to receive certain apparatus. Was this ruling arbitrary and unreasonable? Did it entitle the contractors to collect the excess cost of doing the changed work?*

THE ANSWER: Yes. (Newhall-Herkner Construction Co. v. United States, 89 Fed. Supp. 321, decided by the United States Court of Claims.)

Final-Payment Receipt Released Damage Claim

THE PROBLEM: *A state highway contract provided that the contractor's acceptance of final payment should release the State Highway Department, Board, and Engineer from all claims "for anything done or furnished or relating to the work". Was the contractor's damage claim for being delayed in doing the work released?*

THE ANSWER: Yes. (John Monaghan, Inc., v. State Highway Department, 58 S. E. 2d 242, decided by the Georgia Court of Appeals.)

The Georgia Court of Appeals discussed the question whether generally a contractor's receipt of final payment waives damage claims, apart from cases where the contract, as in this instance, so specifies. The court cited several court decisions in which it was decided that there was a waiver. It concluded that "as a general rule, whether or not acceptance of final payment would operate as a waiver and a release from liability would depend upon the nature of the receipt given or upon the provisions of the contract in this respect, or upon both."

When Check "In Full" Is Not Final Contract Payment

THE PROBLEM: *A contractor and an owner settled a dispute as to the balance due the former, and the owner sent a check for the agreed amount. The check was endorsed as being "final payment in full of all work on contract and extras". Later the contractor discovered that his bookkeeper had erroneously credited to the owner's account a $200 payment that should have been credited to a third party. Was the contractor entitled to sue for the amount due on the original contract, crediting the amount of the check?*

THE ANSWER: Yes. (Mascal v. Shasta Realty Corp., 96 N. Y. Supp. 605, decided by the New York Supreme Court, Special Term, New York County.)

The court decided that it was not necessary that the contractor either return the amount of the check or sue to set aside the agreed settlement.

Drainage Engineer's Pay

THE PROBLEM: *Was an engineer entitled to payment out of special assessment funds of a drainage district for services rendered in preparing a project, although the district authorities disapproved it; he having fully performed his contract?*

THE ANSWER: Yes. (McCall v. Goode, 212 Pac. 2d 209, decided by the Kansas Supreme Court.)

"MORE POWER, WEIGHT and SPEED

makes these TD-24's do more work than any other tractor on this job," says contractor R. K. Nickols

Taking the twists out of Carmel Valley road involves moving 340,000 cubic yards of rugged California terrain. Both Mehren Construction Co. and Los Gattos Construction Co. chose International TD-24's for bulldozing and push-loading here.

R. K. Nickols, contractor, says, "We really get good service from these tractors. They are faster at push-loading our scoops. They have more power, weight and speed and do more work than any other tractors on this job. When push-loaded by TD-24's, scrapers get 15% to 20% more loads on the fill in a day."

And so the story goes from coast to coast, wherever construction and earthmoving jobs are too tough for ordinary tractors, contractors call on the TD-24. These "Champions" dig in and deliver payloads where other tractors have trouble in traveling.

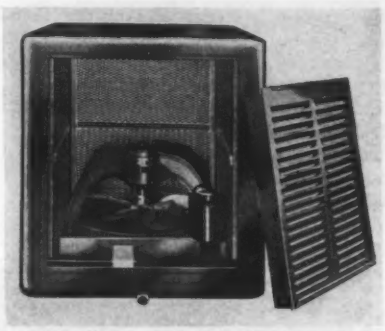
It will pay you to find out what's in the TD-24 for you. Drop in at your nearby International Industrial Power Distributor's place of business and let him show you the reasons why the International TD-24 is known across the nation as the "Champion of Crawlers."

INTERNATIONAL HARVESTER COMPANY, Chicago

New Unit Cools Cabs Of Trucks or Shovels

A compact evaporative cooling unit introduced by International Metal Products Co., P. O. Box 1712, Phoenix, Ariz., is designed to filter and cool air which enters the cabs of trucks and shovels operating in excessively hot and dusty areas.

Available in either a fan or a blower model, the unit is 24 inches high, 26½ inches wide, and 22 inches deep. The lightweight fan model is equipped with a 1/15-hp motor, 14-inch blade, and dual-speed switch. The blower model has an 11⅛ x 8-inch blower wheel, belt-driven by a ¼-hp motor. A 16 x 16-inch air-discharge opening in the bottom permits installation directly over a ventilating hatch without the use of a connecting duct.



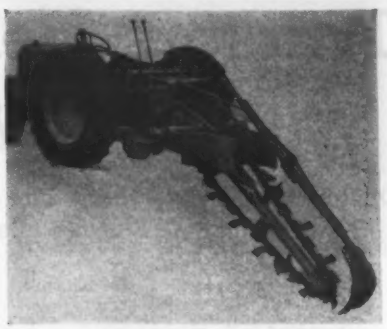
International Metal Products makes this unit for filtering and cooling the air in truck and shovel cabs. Fan and blower models are available.

Removable filter pads on all four sides are said to provide maximum cooling surface and permit easy inspection of the interior. The aspen fiber of which the pads are made is chemically treated, thus increasing its ability to absorb moisture; this increases its efficiency as a cooling and filtering agent, the company says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 102.

New Euclid Service Manager

John E. Ehlert, formerly in the Sales Department of The Euclid Road Machinery Co., Cleveland, Ohio, has been appointed Manager of Service and Parts. He succeeds J. M. Fairbanks.



The Trench Hog digs 3½, 5½, or 7 feet deep, depending on the length of boom, and can be operated at speeds up to 800 feet per hour. It mounts on Ford wheel-type tractors.

New Trenching Unit Is Tractor-Mounted

A new lightweight trenching unit for attachment to Ford wheel-type tractors has been announced by the Arps Corp., New Holstein, Wis. Available with three lengths of booms to permit maximum digging depths of 3½, 5½, and 7 feet, it can be used with cutters ranging in width from 6 to 20 inches in 2-inch steps. The Blackhawk Trench Hog may be operated at speeds up to 800 feet per hour, the company says.

Other features of the unit are quick installation, no special transmission, accurate hydraulic depth control, and quick change from digging to transport position. A bulldozer attachment mounts on the front of the unit for quick backfilling after pipe is installed. The heavy-duty 2-inch roller chain and high-carbon-treated cutters are designed to minimize severe shock and resist abrasion. Special paddles push the dirt away from the trench, while spreader blades follow leaving a path to work on. A depth indicator on the trencher ram tells at a glance the approximate depth to which the unit is digging. Antifriction bearings are used at all critical points on the Trench Hog.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 186.

Offers Contractors' Pumps

A complete line of self-priming centrifugal contractors' pumps is featured in a new catalog offered by The Gorman-Rupp Co., Mansfield, Ohio. The features claimed for these pumps are simple design, quick priming, fast pumping, and long life. The catalog illustrates their priming and pumping action by cross-section illustrations.

Capacities range from the Big Boy's 240,000 gph to a 7,000-gph delivery by two of the lightweight models. Complete specifications, descriptions, and capacity tables are included for each of the models illustrated. The literature points out that the pumps may be furnished on a base, steel wheels, or pneumatic tires. The heavy-duty line may be powered by gasoline or diesel engines; the lightweight line by a variety of gasoline engines.

Also included in the catalog are a single-stage and a four-stage high-pressure jetting pump. These are fully described. At the back of the catalog are recommendations for selecting the correct size of pump, and useful engineering data on the effects of friction, atmospheric pressure, altitude, etc., on pumping action.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 176.

Marvel Buys Marvel

The Marvel Equipment Corp., 215 Eagle St., Brooklyn, N. Y., has purchased the manufacturing facilities of Marvel Equipment Co., Chicago, Ill. The company's vibrators, saws, and grinders are now produced under one roof, and it is expected that delivery schedules can be speeded up.

'Dozing rocky obstacles out of the way on this California mountainside demands TD-24 power.

Push-loading scrapers is faster, more profitable when you have the power, weight and speed of the TD-24 on the job.

INTERNATIONAL HARVESTER

INTERNATIONAL INDUSTRIAL POWER

Tractors Help Plows In Dirty Snowdrifts

Dust-Bowl District Fights Dirt and Snow Combination With Tractors to Prolong Life of Regular Equipment

"A hard, dull bitterness of cold
That checked mid-vein the circling race
Of lifeblood in the sharpened face;
The coming of the snowstorm told . . ."

✦ ROARING down across the Great Plains of Wyoming, the blizzard soon reached McCook, Nebr., in the southwestern part of the state. Half the farm fields, summer-fallowed and bare, lay exposed to the storm. In the 60-mile-an-hour wind, the dirt and dust picked up and mixed with heavy white flakes of snow.

In McCook, that winter evening last year, it grew dark early. A few tough citizens, with coat collars drawn tight to protect faces from the stinging blast, leaned against the blizzard in their hurry to get home. As the hours passed, the storm got worse. For 48 hours the blizzard raged at 60 miles an hour. Maintenance men from the Nebraska Department of Roads and Irrigation, working out of the McCook District Office, did the best they could to keep U. S. 6 and U. S. 34 open.

When it was finally quiet again, District Engineer D. O. Coolidge and some of his men surveyed the damage. Piled high were 18-foot drifts of heavy, dirty snow. But in many places those heavy drifts, hard enough to support a truck, had been ripped through to the highway. There were few places where the road was blocked.

Coolidge remarked, "If we'd had those tractors two winters ago, 'Operation Haylift' would have had it easier."

For District 6 has found a way to whip its peculiar snow problem. Light, fluffy snow of the type that action photographers of V-plows like to take just doesn't fall at McCook. It is a heavy blend of snow and wind-blown dirt from fallowed fields that packs down so tight ordinary equipment will tear itself apart trying to fight it.

So at three locations in District 6, within about 30 minutes from any trouble zone, a Caterpillar D7 or an Allis-Chalmers HD-14 is stationed. It is equipped with a snow blade. Let a drift develop that's too heavy for the V-plows to handle, and one of these tractors speeds out to the spot, crawls down off the lowboy trailer, and goes to work. Since the snow is heavy enough to support a tractor, the machine works from the top and breaks through the drift.

When it is down to within about 6 inches of the highway, where the grousers are loosening the last bit of snow, the V-plows or one-ways take over the cleanup job. That prevents any damage to the bituminous surfaces.

This use of tractors has simplified snow removal. Regardless of the fact that a tractor is a slow machine in snow, the machines have made the operation of push plows and V's much more efficient. In the heavy, dirty snow at McCook, a V-plow can ordinarily take care of the situation, but the plains country with its high wind makes for drifting snow. If a V-plow takes enough time out to fight a heavy drift, the time it loses can often let many miles of road block in, which otherwise would stay open.

According to Coolidge, the tractors are unbeatable. The operators, snug and comfortable in their enclosed cabs, have never found a drift they couldn't move.

(*Concluded on next page*)

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Colors in One Quality Pencil
actual size
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No finer gift than Norma. Jewelry crafted, precision-engineered. Guaranteed for mechanical perfection. Appropriately boxed. From $4.50 up—at all the better stores.
ENGINEERS find Norma indispensable for speeding work on blueprints, plans, schedules, etc. . . . Yellow may be substituted for any color on request. Write for new booklet giving many other uses for 4-color Norma Pencils; no obligation.

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137 West 14th Street, New York 11, N. Y.
Please send me, without charge, your new color booklet showing how Norma Pencils help to speed special daily tasks.
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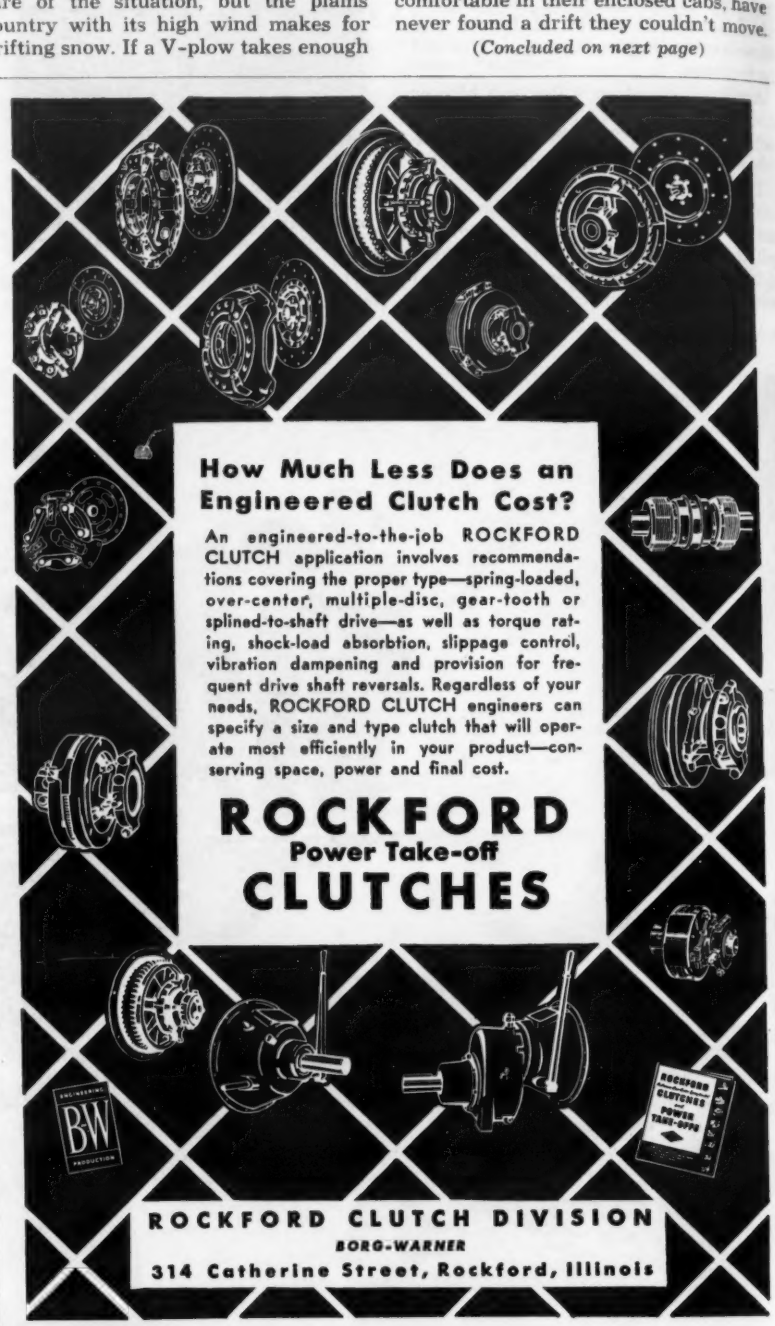
Address.....
City.....Zone.....State.....


How Much Less Does an Engineered Clutch Cost?
An engineered-to-the-job ROCKFORD CLUTCH application involves recommendations covering the proper type—spring-loaded, over-center, multiple-disc, gear-tooth or splined-to-shaft drive—as well as torque rating, shock-load absorbtion, slippage control, vibration dampening and provision for frequent drive shaft reversals. Regardless of your needs, ROCKFORD CLUTCH engineers can specify a size and type clutch that will operate most efficiently in your product—conserving space, power and final cost.
ROCKFORD
Power Take-off
CLUTCHES
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ROCKFORD CLUTCH DIVISION
BORG-WARNER
314 Catherine Street, Rockford, Illinois

THE "HUSKY"
Model 22
All-Purpose Grader Shouldering Machine

With 9-ft. TRAILER DRAG doing Shoulder Maintenance on a Minnesota State Highway

Note the sturdy Trailer Drag, adjustable to any position.

Can be supplied with 11-ft. Drag for general road dragging, completing operation in only one round trip.

There is nothing better than a good blade grader to recondition shoulders. One end of the Trailer Drag rides on pavement as a gauge. The outer end cut is regulated by the Trailer wheel adjusted to any position wanted.

The State Highway Departments of Minnesota, Michigan, Delaware, Maryland and Texas are using them, and Wisconsin Counties of Buffalo and Dane use them on the State roads. Write these people. So strong and well built all parts are guaranteed against breakage for one year regardless of why they may break.

Manufactured by
NORTHFIELD IRON COMPANY, P. O. Box 30-A, NORTHFIELD, MINN., U. S. A.

The tractors take the brutal punishment in their stride, saving wear and tear on conventional equipment.

Otherwise, Usual Methods

With the exception of this refinement, which was made following the disastrous winter of 1948-49, snow-removal methods are largely conventional. The snow season extends from about October 15 to April 1, with the period of heavy blizzard from December 15 to March 1.

Despite the precaution regarding heavy drifts, District 6 operates on the theory—as most efficient snow crews do—that it is easier to keep a highway open than to open one that is blocked. The first light snows are handled by fast one-way plows, mounted on the trucks which haul gravel and patch material in summer. Later the heavy V-plows, mounted on 4-wheel-drive units, work as the snow gets heavier. These rigs also crowd the snow windrow out away from the highway shoulder. When the going gets too tough for a V, the rotary Snogos, always accompanied by a V-plow, take over. When the going gets too tough for this combination, the tractors move in and break through.

District Organization

There are about 1,100 miles of snow maintenance in District 6, which lies along the Kansas-Colorado-Wyoming corner of the state. Roads in the eastern part of the district are much more closely spaced than those in the western part. Therefore the mileage is divided according to local conditions.

George Koster, Resident Engineer at Holdredge, has the biggest slug: 500 miles. Perry Sparks, Chief Patrolman at McCook, controls 300 miles. Out at Imperial, Del Noel, Maintenance Foreman, has 200 miles. Eugene Speck, Maintenance Foreman, has about 100 miles. All these men report directly to Coolidge. U. S. 6 and 34, which carry about 2,000 cars a day averaged over the year, are the main transcontinental highways and rate the highest snow-removal priority.

At McCook, Sparks uses an FWD truck with a V-plow, an Oshkosh 7-ton machine with a V-plow and wing, a Snogo rotary, a 4-wheel-drive Marmon-Herrington with a V, and 7 one-way push plows.

At Holdredge, there is an FWD with a small-model Snogo rotary plow, 3 FWD's with V-plows, and from 7 to 8 one-way push plows. A Marmon-Herrington with a V-plow is stationed at Wilsonville, with the same equipment at Benkelman plus two push plows.

Imperial, west of McCook, has two FWD's with V's, and four one-way plows. The tractors are located at Imperial, McCook, and Elwood—all potential trouble spots.

Necessary repairs, if they must be made immediately, are often made in the field. Repairs which will take more than an hour or so are made in the local shops, or the unit is trailered into the central headquarters at McCook, where modern repair facilities are located in a warm concrete-block building. Breakdowns have diminished noticeably since

C. & E. M. Photo
D. O. Coolidge, District Engineer, at McCook, Nebr., directs much of the snow fighting.

the tractors took over the drift-busting.

Snow-removal operations in Nebraska are under the general supervision of F. H. Klietsch, State Engineer, and John McMeekin, Maintenance Engineer.

Hardpan Subsoiler Goes Down 18 Inches

A new subsoiler which will penetrate 18 inches has been developed by Harry Ferguson, Inc., 3639 E. Milwaukee Ave., Detroit 11, Mich. It attaches to the Ferguson System linkage, and working depth is adjusted from the seat of the tractor by finger-tip control.

The beam is made of specially rolled high-carbon steel to withstand the shock of hitting subsurface rocks during operation. Its front surface is rounded to deflect trash and to furnish maximum strength with minimum draft and weight. The reversible tooth is made of high-carbon steel for wear and shock resistance. Special design protects the recessed nut and bolt from abrasive action, and the reversible feature provides double life of the tooth.

An exclusive feature of the Ferguson subsoiler is its caster and spring-mounted coulter disk with three possible adjustments for depth control. The coulter cuts through sod allowing the

The new Ferguson subsoiler breaks up thick layers of hardpan and grubs out roots, stumps, and rocks.

beam to pass through with minimum sod disturbance. In hard, dry clay soils, where maximum surface breaking and subsoil shattering for water conservation are required, the coulter attachment need not be used. The subsoiler will break up thick layers of hardpan and grub out heavy roots, stumps, and rocks, says Ferguson.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 105.

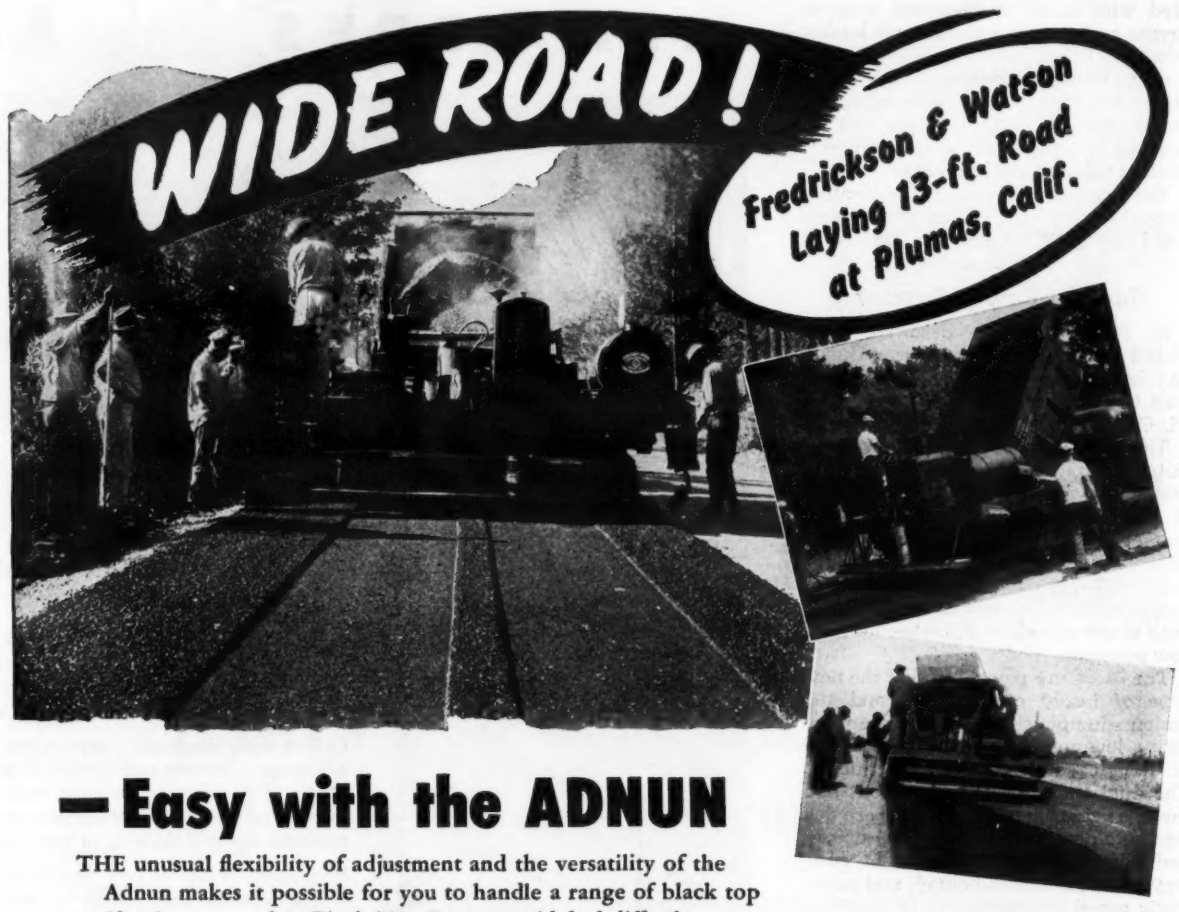
A. C. CURRENT ANYWHERE

WITH KATOLIGHT LIGHTING PLANTS

from 350 watts to 25 K.W., generates standard 60 cycle A.C. current, same as the High Line. A.C. Generators from 300 W. to 300 Kilowatts. Speeds of 720, 900, 1200 & 1800 RPM. Rotary Converters, single phase & three phase A.C. Motors.

Write today or see your auto parts jobber or equipment dealer.

KATO ENGINEERING COMPANY
118 Maxfield Ave.
Mankato, Minnesota
U.S.A.



— Easy with the ADNUN

THE unusual flexibility of adjustment and the versatility of the Adnun makes it possible for you to handle a range of black top specifications any other Black Top Paver would find difficult.

Wide road beyond the width of the standard hopper is easy with the Cutter Bar Extension and Edger Plates. Hydraulic Controls and End Gates permit feeding material out beyond hopper. Roads up to 13 ft. have been laid successfully.

Cutter Bar adjustments permit laying any Crown or Bank and on shoulder widening the new shoulder can be feathered into the old crown. With hopper sections narrow strips can be laid between car lines or parallel to existing road for any degree of shoulder widening. Full control of the tilt of the Cutter Bar along with a Screed Heater assures the efficient handling of any type of mix. No other Black Top Paver gives you such range of control.

If you are figuring on a black top job you should have full details.

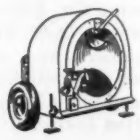
THE FOOTE COMPANY, INC.
Subsidiary of Blaw-Knox Co.
1916 State Street • Nunda, New York

(above) Laying 11-ft. road in Indiana.

(below) Road widening and feathering into the road crown.

If you pour concrete the Foote HighLift Boom will cut your pouring costs.

The Kinetic Asphalt Mixer saves money on patching and repair jobs.



ADNUN
TRADE MARK REGISTERED
BLACK TOP PAVER

Gray's Dual-Duty Luberator, for high-pressure and volume greasing, comes in two models, bucket and exposed pail.

New Hand Lubricator Takes Pail or Bucket

A new dual-use hand-operated lubricator has been announced by Gray Co., Inc., Graco Square, Minneapolis 13, Minn. The Luberator may be operated with a 25 or 35-pound original grease pail or with a double-can bucket which is filled from the original container. Pump and delivery features for either use are the same. The company states that up to 75 bearings can be greased on one filling of the reservoir control valve of the lubricator.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 238.

Mobile Power Barrow

A 2-page circular describing the Model DB-50 Whiteman Power Buggy has been prepared by the Whiteman Mfg. Co., 3249 Casitas Ave., Los Angeles 26, Calif.

This unit is powered by a heavy-duty 7.5-hp 4-cycle air-cooled engine which provides speeds up to 16 mph. It is available with a 13-cubic-foot bucket body or a 2,000-pound-capacity flat-rack stake body. The Power Buggy has a 42-inch wheelbase, an overall length of 82 inches, and an overall width with single wheels of 36 inches for narrow passages.

The literature points out that the new type of heavy curved rack and the pinion dumping mechanism improve lifting leverage and permit full control of dumping and return of the bucket. The dual load wheels in the front and the two drive wheels at the rear are designed to distribute the weight properly and eliminate breakage of light runways. The automatic clutch and automatic speed changer simplify handling and reduce maintenance expenses, according to the literature. Complete specifications and all other features of the Whiteman Power Buggy are listed in the circular.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 181.

Building With Timber

A new pictorial bulletin, "Timber for Military, Commercial, and Industrial Buildings", is offered by Timber Engineering Co., 1319 18th St., N. W., Washington 6, D. C., to interested architects, engineers, and contractors. It is devoted to outstanding examples of structures built of timber in all parts of the United States.

It presents the uses to which the Teco connector system of timber construction, using wedge-fitted split-ring connectors and Trip-L-Grip framing anchors, has been put in many types of buildings. It also treats glued-laminated timber construction and decorative lamella construction. Drawings supplement the photographs. Sturdiness, durability, practicability, and economy in construction time, labor, and materials are features claimed for the Teco system. The brochure also lists roof-truss and timber fabricators in all parts of the country.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 111.

Sectional Scaffolding

New Waco catalogs Form PS-20 and Form PS-19 on the basic unit and adaptations of Waco steel scaffolding have been announced by Wilson-Albrecht Co., Inc., 3565 Wooddale Ave., Minneapolis 16, Minn. This new literature on tubular sectional scaffolding contains complete information on the assembly parts, typical assemblies, load tests, speed tests, and safety rules. The products are fully described and illustrated with line drawings. Typical assembly drawings show the variety of applications for Waco scaffolding.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 210.

SOLVE YOUR HAULING PROBLEMS WITH A "TRANSPORT TRAILER"

Capacities through 75 Ton—Semi and Full Trailers

CARGO CARRIER MODEL GPX (Semi) with Tandem Axles

PATENTED TANDEM AXLE ASSEMBLY—Featuring unusual lengthwise and sidewise wheel accommodation to irregularities in the road. Use of full width tubular, forged heat treated axles with CAMBER.

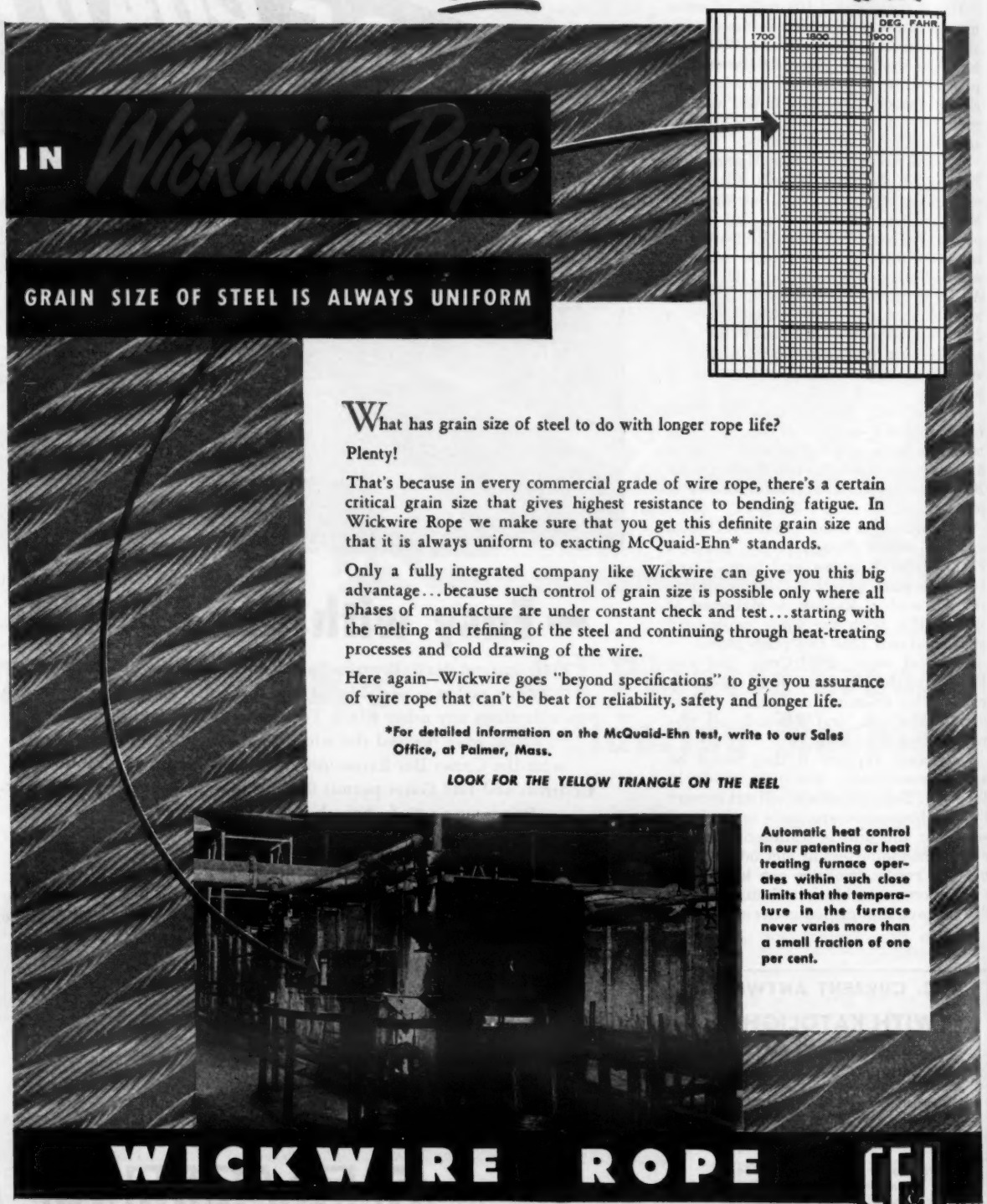
FRAME—Constructed of beam sections throughout, electric welded. A ruggedly strong and efficient unit with minimum weight.

TRANSPORT TRAILERS, INC.

TRANSPORTATION ENGINEERING A SPECIALTY

CEDAR RAPIDS, IOWA, U.S.A.

ALL ROPES look ALIKE... but



What has grain size of steel to do with longer rope life?

Plenty!

That's because in every commercial grade of wire rope, there's a certain critical grain size that gives highest resistance to bending fatigue. In Wickwire Rope we make sure that you get this definite grain size and that it is always uniform to exacting McQuaid-Ehn* standards.

Only a fully integrated company like Wickwire can give you this big advantage...because such control of grain size is possible only where all phases of manufacture are under constant check and test...starting with the melting and refining of the steel and continuing through heat-treating processes and cold drawing of the wire.

Here again—Wickwire goes "beyond specifications" to give you assurance of wire rope that can't be beat for reliability, safety and longer life.

*For detailed information on the McQuaid-Ehn test, write to our Sales Office, at Palmer, Mass.

LOOK FOR THE YELLOW TRIANGLE ON THE REEL

Automatic heat control in our patenting or heat treating furnace operates within such close limits that the temperature in the furnace never varies more than a small fraction of one per cent.

WICKWIRE ROPE

CF&I & SUBSIDIARIES

A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass. EXECUTIVE OFFICE—500 Fifth Avenue, New York 18, N.Y.

SALES OFFICES—Abilene (Tex.) • Boston • Buffalo • Chattanooga • Chicago • Denver • Detroit • Emlenton (Pa.) • Philadelphia • Phoenix • Salt Lake City Tulsa • Odessa (Tex.) • Houston • New York

PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

This handy gage shows when and to what angle to grind a dull tungsten-carbide Rok-Bit. It is available from Rock Bit Sales & Service Co., 2514 E. Cumberland St., Philadelphia 25, Pa.

Hydraulic Steering For Ease in Driving

A hydraulic power steering gear designed to provide driving ease and added safety has been developed by Saginaw Steering Gear Division, General Motors Corp., Saginaw, Mich. It combines the components of modern conventional heavy-duty steering gear with a double-acting hydraulic cylinder and control drive. Hydraulic pressure is provided by a pump, either engine or electric-motor driven.

The mechanism operates as follows. After a predetermined amount of physical effort has been applied, operation of the steering wheel opens or closes the control valve, causing the power cylinder to exert additional hydraulic help to the output shaft. This power actuation is obtained, the company says, without in any way disturbing the positive mechanical line of control from the steering wheel to the road wheel. This means that complete mechanical control by manual effort remains available for emergency use.

With the Saginaw hydraulic steering gear, the power applied by the hydraulic mechanism is directly proportional to the resistance to the steering movement offered by the front wheels. This permits the driver to retain the "feel" of the road, with good directional stability. The unit practically eliminates road shock and "wheel-fight", the company says, since the hydraulic cylinder automatically resists the tendency to deflect the front wheels. This unit may be adapted for use on trucks, tractors, prime movers, or other contracting and earth-moving machinery.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 225.

Electric Fuel Pump

A new electric fuel pump, designed to fit any gasoline engine as a replacement part has been announced by Vepco Fuel Pump Sales, 17304 Lahser Road, Detroit 19, Mich. The Vepco 6-volt unit at 3½-pound pressure can be raised or lowered as desired and has a delivery capacity of 18 to 20 gallons of fuel per hour with a current consumption drawing 6/10 amp from the battery. This pump comes in 6, 12, 24, and 32-volt models with other voltages available as specified.

The company claims that the efficiency of this electric fuel pump is not affected by altitude or atmospheric changes and that it will operate satisfactorily at all temperatures. It may be mounted in any position with 2, 3, 4, or more pumps mounted in parallel on fuel lines where increased capacity is desired. The company states that the Vepco pump will positively eliminate vapor lock and is so waterproofed as to operate completely submerged. The pumping unit is die-cast aluminum; the shell is made of plastic to eliminate rusting from condensation.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 133.

Heavy-Duty Form Panels

A new bulletin available from Symons Clamp & Mfg. Co., 4251 Diversey Ave., Chicago 39, Ill., features Symons plywood form panels with steel cross members.

The bulletin illustrates three different panel sizes, 2 x 4, 2 x 6, and 2 x 8 feet, as well as the individual pieces used in constructing the steel cross members. Included in the bulletin is a chart showing the hardware required for panels with steel cross members.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 135.

Emergency? Call Operator 25

Drivers of GMC trucks can locate the nearest GMC-approved service in any part of the country by calling Western Union and asking for Operator 25, who will give them directions and other information. This service is the first of its kind in the trucking industry. The GMC Truck & Coach Division will pay for the service.

We've got 'em . . . for IMMEDIATE DELIVERY

TARPAULINS

Guaranteed new and first quality, 12 oz. per sq. yd. Grey Weight. With large rust-proof brass grommets.

	ea. net
15 x 20 Waterproofed	$29.25
20 x 20 Waterproofed	$39.00
15 x 20 Flameproofed & Waterproofed	$33.40
20 x 20 Flameproofed & Waterproofed	$44.50

F.O.B. North Little Rock, Arkansas.

Other Tarpaulin sizes and grades also in stock at proportionate prices.

Write us your needs.

OZARK CANVAS CORP. Phone 5-3203 Dept. A, 116 E. 12th St. North Little Rock, Ark.

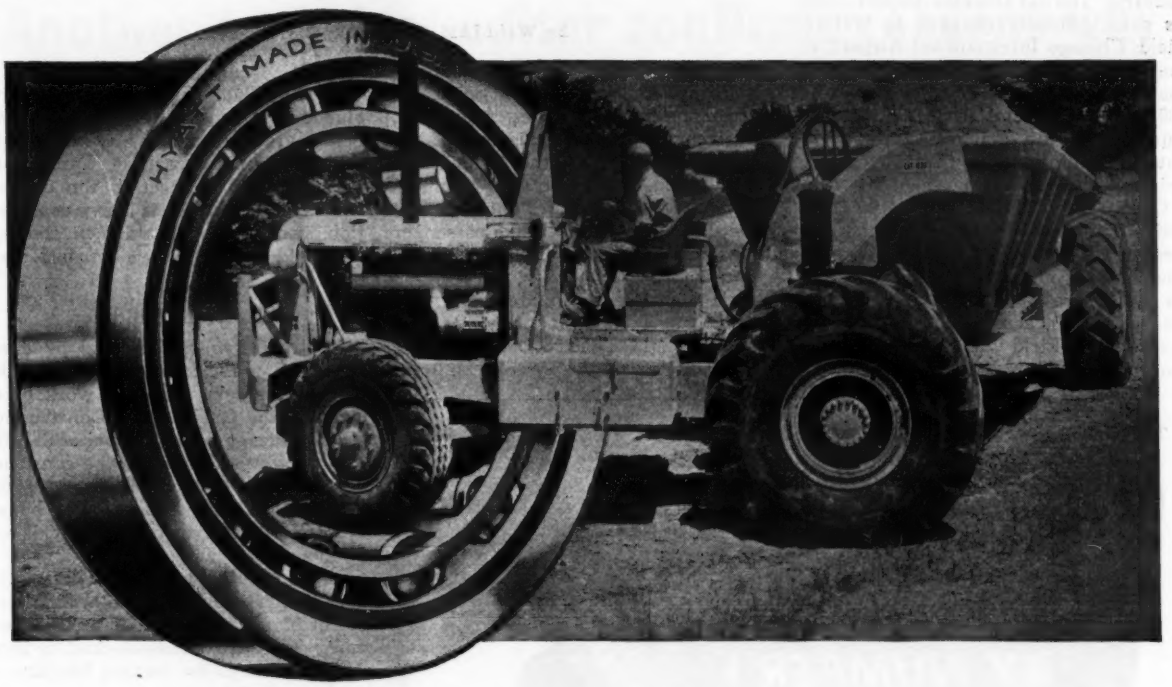
For the sake of your children, buy and use Christmas Seals.

Thanks to Seals, children today have a far greater chance of escaping TB than you did.

To give them a still better chance, send your contribution today, please.

buy Christmas Seals

Because of the importance of the above message this space has been contributed by Contractors & Engineers Monthly



HYATT and CATERPILLAR Partners in Performance

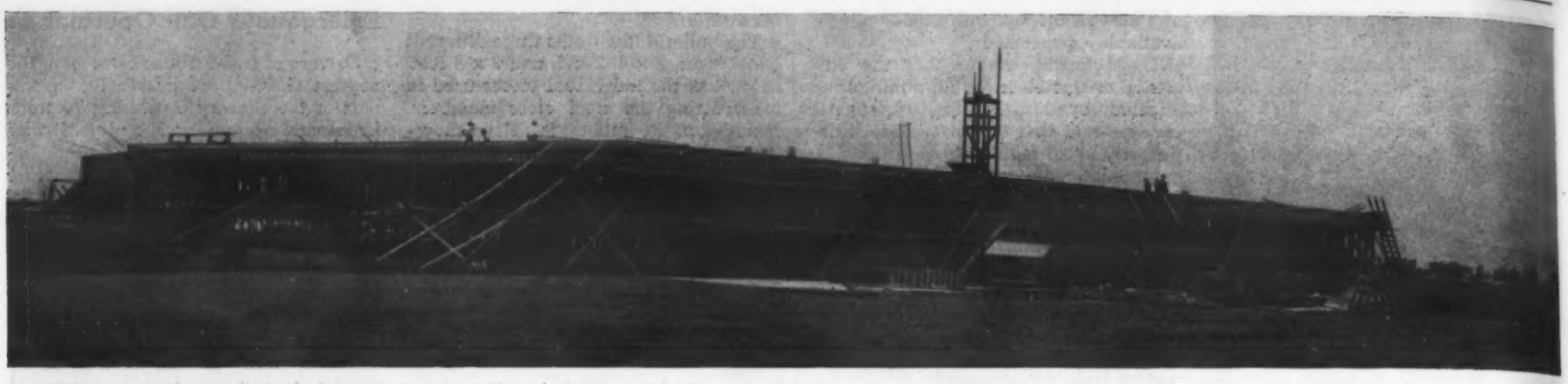
THE new "CAT" DW20, latest of Caterpillar Tractor Co.'s wheel tractors, is the result of five years of intensive research, design engineering and job-proved application.

One of the outstanding features that provides dependability and easier operation of this new tractor is the application of Hyatt Roller Bearings. Proved through the years on all types of "Caterpillar" products, Hyatts make the turning of wheels, gears and shafts easier—reduce wear and care—perform smoothly under the toughest conditions and come back the next day ready for more.

• • •

With Hyatts in the vital positions, Caterpillar, like so many equipment builders, helps build performance into the equipment they make. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS



Finger of Terminal Building Erected at Windy-City Airport

First Unit of Finger-Type Structure Built on Two Levels, of Reinforced Concrete Part of Big Expansion Program

By WILLIAM H. QUIRK, Eastern Editor

✦ BY 1960, Chicago, the nation's second-largest city, will have one of the largest and most modern airports in the country. The old Douglas Airport, with its name officially changed to O'Hare Field, Chicago International Airport, is the site of a huge expansion program that will take ten years and some $90,000,000 to complete. Funds are being supplied by the Federal Civil Aeronautics Administration, the state of Illinois, and the city of Chicago.

O'Hare Field is located near Park Ridge in Illinois, about 15 miles northwest of Chicago's downtown Loop district, and beyond the Windy City limits. Its 1,080 acres will ultimately be increased to 7,000 acres. A Class VIII airport, O'Hare Field will eventually have ten runways with lengths up to 9,700 feet to accommodate the largest commercial and military planes. At present, the airport is the headquarters of the 66th Fighter Wing of the Illinois National Guard, and is also used commercially as a Slick Air Freight terminal. Eventually the field will take passenger flights now handled by the smaller Chicago Airport.

Improvements got under way last year when a $2,113,150 contract was awarded by the Chicago Department of Public Works to the Arcole Midwest Corp. of Skokie, Ill. Contract 1 included a variety of items, among them being grading, utilities, water-supply system, sewers, parking apron, and taxiways that connect to the existing runways. The apron is heavy construction, consisting of a 15-inch concrete slab laid on a 12-inch crushed-stone base.

Terminal Building

Contract 1 was completed by June, 1950, in time for contract 2 to get under way on June 27, with the work being given to the Great Lakes Construction Co. of Chicago on its low bid of $1,320,899. Contract 2 includes the construction of a portion of Finger B of the terminal building, and a boiler house. This first finger-type construction is one of five which will ultimately form a spacious terminal building. These split-finger units permit the maximum number of planes to be loaded at the same time. They are double-decked, or two-story, buildings for loading baggage at the lower level and passengers from the upper deck. Passengers will move over telescoping aluminum ramps, about 100 feet long, from the upper deck to the planes. These ramps can be swung in a wide arc, to the moored aircraft.

The terminal building is located at the southerly end of the present field, close to the intersection of Bryn Mawr Road and Wolf Road. The portion of Finger B known as contract 2 is 362 feet long with a width of 184 feet along the central part of the future terminal building; it tapers to a 50-foot width at the projecting end of the "finger". It has a roof height of 33 feet above the concrete slab for its two-story reinforced-concrete construction. The exterior walls are face brick and stone veneer. The lower, or transportation, level has a height of 15 feet, while the second floor, or concourse level, is 18 feet high. The roof will have a promenade, and will also mount various lights and beacons.

Interior columns on the first-floor level range from 16 to 22-inch square, and their average spacing forms bays 30 feet long x 21 feet 6 inches wide. Exterior columns on the lower level, and all those on the second floor, are round with diameters varying from 16 to 22 inches. Floor slabs are concrete joist construction. Slabs alone are 3 inches thick, with the joists extending to a depth of 14 inches below the bottom of the slab and spaced 35½ inches on centers. At their bottoms, the joists narrow down to a width of 5½ inches.

Around the exterior of the framework at floor level are spandrel beams of varying dimensions, according to the

(Continued on next page)

The Tenth of a Series in the interest of more efficient use of steel . . . a vital American resource

LACLEDE *Multi-Rib* Reinforcing Bars

ROUND BARS in all sizes . . . to meet latest ASTM A305 Specifications . . . conveniently marked to make your specification job easier. And, of course, improved Laclede deformations mean uniform reinforcement strength, maximum anchorage — plus a more efficient use of steel by eliminating hooks and shortening embedment lengths.

TABLE OF ASTM A305 SPECIFICATIONS

		NOMINAL DIMENSIONS ROUND SECTIONS			REQUIREMENTS OF DEFORMATIONS		
Bar No.*	Unit Wt. Lbs./Ft.	Diameter-Inches Decimal	Cross Sectional Area Sq. Inches	Perimeter	Max. Avg. Spacing In.	Min. Height Inches	Max. Gap. Inches°
2†	0.167	0.250	0.05	0.785	.. ..	.. .	.. ..
3	0.376	0.375	0.11	1.178	0.262	0.015	0.143
4	0.668	0.500	0.20	1.571	0.350	0.020	0.191
5	1.043	0.625	0.31	1.963	0.437	0.028	0.239
6	1.502	0.750	0.44	2.356	0.526	0.038	0.286
7	2.044	0.875	0.60	2.749	0.612	0.044	0.334
8	2.670	1.000	0.79	3.142	0.700	0.050	0.383
9‡	3.400	1.128	1.00	3.544	0.790	0.056	0.431
10‡	4.303	1.270	1.27	3.990	0.889	0.064	0.487
11‡	5.313	1.410	1.56	4.430	0.987	0.071	0.540

*Bar numbers are based on the number of ⅛ inches in the nominal diameter of the section.
†Bar number 2 in plain rounds only.
‡Bars numbered 9-10-11 correspond to former 1" sq., 1⅛" sq., and 1¼" sq. sizes, and are equivalent to those former standard bar sizes in weights and nominal cross-sectional areas.
°Chord of 12 ½% of Nom. Perimeter.

"For the *BEST* in Reinforcing Steel—Specify Laclede"

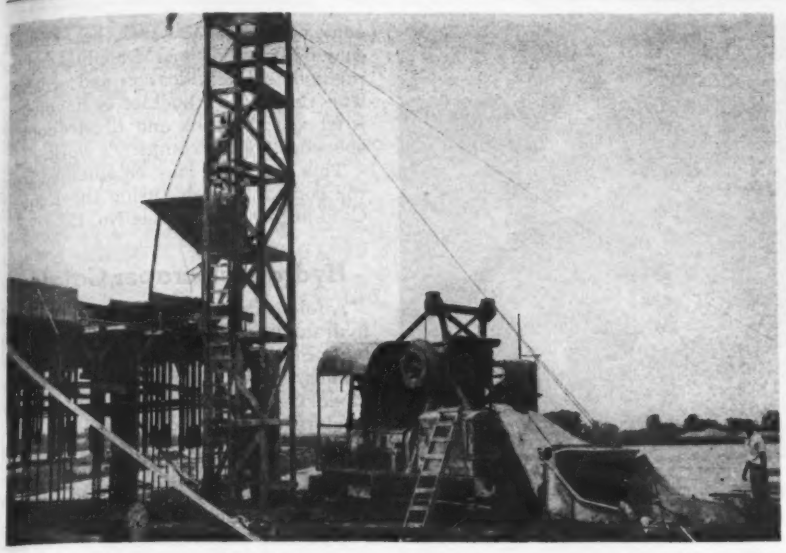
LACLEDE STEEL COMPANY
Producers of Construction Steel
St. Louis, Mo.

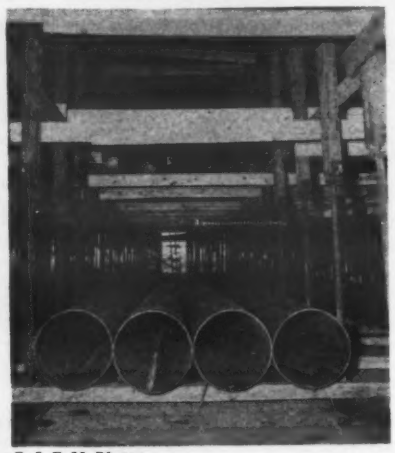
This TRI-LINE CUTTER *RIPS Through Concrete to DEPTHS of 6½ inches*
It's Powered by a 2-Cylinder
WISCONSIN ENGINE!

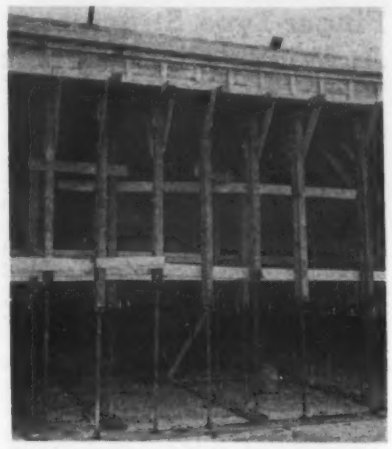
Operating like a powerful rip saw, this Wisconsin-powered TRI-LINE Concrete Cutter made by Tri-Line Co., Racine, Wisconsin, produces a fast, smooth-surfaced, easily controlled cut as deep as 6½ inches without cracking or spalling concrete, asphalt, granite, marble, tile or terrazzo.

Whether you build or buy heavy-duty construction equipment, the importance of *packing more power into smaller space* is quickly apparent . . . and it's possible with Wisconsin Engines because every Wisconsin crankshaft rides on tapered roller bearings at both ends, permitting the mounting of pulley directly on shaft, and eliminating outboard bearing. Such features as foolproof, any-climate air-cooling and an easily-serviced OUTSIDE magneto with impulse coupling for quick-starting at all seasons are your best assurance that the power plant you get with your equipment will live up to the service purpose of the machine itself. . . . Write for detailed information. 4-cycle, single-cylinder, 2-cylinder, and V-type 4-cylinder models, 3 to 30 hp.

MOST H.P. HOURS
WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46 WISCONSIN







C. & E. M. Photos

Concrete for the O'Hare Field Terminal was mixed in a Ransome 27-E paver (left) and raised by a Thomas hoist in the timber tower shown during erection. Round exterior columns of the building were built with Sonotube fiber forms (center photo). RooShors on 2-foot average centers (right) supported forms for reinforced-concrete beams.

loading. Interior beams are likewise of varying rectangular dimensions, usually 18 inches in width and from 24 to 36 inches deep. The roof is of concrete slab construction similar to that on the concourse level, covered with builtup composition surfacing. In the promenade area the roof has a cement topping.

Form Work

For cutting form lumber, the contractor set up on the project a C.H.&E. 10-inch-blade table saw. Forms for the square interior columns were made from ¾-inch plywood, held in place with 1 x 3's, nailed horizontally 16 inches apart, and with Roos column clamps. The circular columns were built with Sonotube tubular fiber forms which were slipped into position after the spiral reinforcing had been erected. In this way any possible scratching of the forms with the insertion of the steel was prevented. After the pours the paper tubes were readily split in two with a special wire device that facilitated their removal.

Beam forms were constructed with 2-inch lumber on the bottoms, and ¾-inch plywood on the exposed sides. On the sides where the beams are covered with brick or stone veneer, ¾-inch sheeting was used instead. Deep beams were backed with 2 x 6 studs on 16-inch centers, and with double 2 x 4 wales on from 12 to 16-inch centers, connected by Richmond ties. Beams were supported on RooShors with tie heads, spaced on an average of 2 feet on centers. Each shore had a 3,000-pound capacity.

Slabs and joists were formed with steel-pan construction, the pans being furnished by the Gateway Engineering Co., and erected by Gateway Erectors, Inc., both of Chicago. These adjustable steel forms were supported along the haunch line by RooShors on a 3½ to 4-foot spacing, set up on 2 x 10 sills placed on the concrete-slab foundation or first-floor level. The long rows of shores were tied together both ways with 1 x 6 scabs nailed about halfway up their height. On top they were capped with 4 x 4's, across which were laid 2 x 10 stringers on 5-foot centers. The stringers were crossed with 4 x 4's at the haunch line. Joists were brought to exact grade with 2 x 6 soffits placed on top of the 4 x 4's.

Concrete Operations

Approximately 4,000 cubic yards of concrete and 250 tons of reinforcing steel are required in contract 2. Reinforcing steel was supplied by the Trus-

(*Concluded on next page*)

NAMEPLATE and IDENTIFY Your EQUIPMENT WITH CHICAGO DECALS

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For Information and Samples Write:
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3310 N. Elston Ave., Chicago 18, Ill.

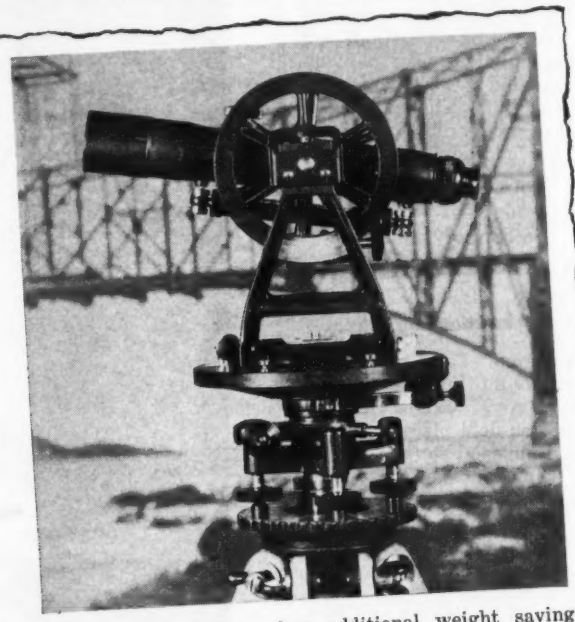
The Red Cross Carries On!

GIVE!

Another technical editor confirms reasons why engineers prefer Gurley Aluminum Transits

Combining durability and lightness with precision for surveying transits

by David W. Veit
Editor, Die Castings Magazine



MANY surveying instruments built by W. & L. E. Gurley, Troy, N. Y., are accurate within one second of arc. If projected, this represents a maximum error of ⅝ inch in a mile.

However, precision is not the only requirement of these instruments. At least three other major factors influence the design and choice of materials for this type of equipment.

In the first place, a surveyor's transit must not only *be* accurate, but must maintain its accuracy over an indefinite period of years despite all sorts of weather and climatic conditions —heat, sub-zero temperatures, dampness, dust or salt-saturated atmospheres.

Second, it must withstand rough usage. This is outdoor equipment subjected to impact and abrasion.

The third requirement — no less important than the other two to the surveyor who carries the transit around all day long —is lightness.

The combination of accuracy and ruggedness could be secured by constructing the transit of heavy-sectioned castings, forgings or fabrications in steel or bronze, extensively machined and elaborately assembled. This choice of materials would, however, fail to include one significant feature—lightness.

The way in which Gurley has been able to combine all three desirable features has been by turning to aluminum for a major group of components. And since aluminum has been picked to fulfill the physical and mechanical needs of these surveyor's transits, it is not surprising that several of the most important parts are being produced most economically by die casting.

Die cast aluminum parts include the truss standard, telescope housing and leveling spider, as well as rod targets and tripod clamps. Aluminum alloys used for these transits have greater stability and rigidity than bronze. In addition, the die casting process permits unitary construction of the mounting frame, contributing further to rigidity.

From the point of view of weight reduction, aluminum die castings have permitted a 25 percent decrease in total weight, as compared with sand cast bronze. Die cast aluminum offers additional weight saving advantage, even as compared with sand cast aluminum, due to the thin, uniform wall section which is practical by die casting.

This pioneering instrument builder has used aluminum die castings wherever possible; this is one of the few production short cuts possible in a manufacturing operation characterized by extensive machining, finishing and assembling operations within close tolerances.

This company has maintained its leadership in the field of engineering and other types of instruments by a willingness to investigate and introduce into their production line the new materials and methods made available by technological advance. The excellent reputation of this company's instruments during the past century is sufficient testimony for the reliability of the materials which they use.

Reprints of the full-length article from which this is reproduced are available on request.

GURLEY
Surveying and Scientific Instrument Makers
Since 1845

Field-proven over 74 years—Gurley Aluminum Transits are used from the Arctic to the Tropics. In the words of a combat engineer during World War II, "These instruments were subjected to the worst degree of heat, cold, mud, and dust a transit *should not* have. After being dropped, and everything else imaginable, they still did work up to par." The first Gurley Aluminum Transit was retired after 50 years of service to join the exhibit of Gurley "firsts." Gurley Instruments are described in Bulletin 50. Would you like a copy?

W. & L. E. GURLEY, FULTON & STATION STS., TROY, NEW YORK
Surveying and Engineering Instruments, Hydraulic Engineering Instruments, Standard Precision Weights and Measures, Paper and Textile Testing Instruments, Reticle Making Facilities, Aeronautical Navigating Instruments and Meteorological Instruments

Finger-Type Structure At Windy City's Airport

(*Continued from preceding page*)

con Steel Co. of Youngstown, Ohio, while dry concrete batches were furnished by Materials Service Co. of Chicago from a branch plant only 2 miles from the job site. Water was available from the airport mains. One-yard batches were mixed in a Ransome 27-E paver set up at one end of the building.

The boom was removed from the paver so that the concrete might be discharged directly into a 1-yard bucket at the bottom of a timber tower equipped with a Thomas two-drum hoist. The 40-foot tower was securely supported with guys running out to anchors in the concrete apron. The bucket of concrete was raised to the level being poured, and emptied into a 3-yard floor hopper. From that the concrete was discharged into rubber-tired buggies which were pushed to the forms. As the concrete was placed, it was vibrated with a Dreyer vibrator. A spray compound was used in the curing process.

In the columns, reinforced with spiral steel, concrete with a design strength of 3,750 pounds to the square inch at 28 days was employed. For the beams and slabs, reinforced with welded mesh and new billet steel, a 3,000-pound concrete was used. Concreting operations got under way the end of August; an average day's production was 200 yards over a single 8-hour shift. The building is scheduled for completion by June, 1951. Contract 3 for additional foundation slabs and extension of underground facilities was to be awarded this fall.

Personnel

The Great Lakes Construction Co., general contractor, employed an average force of 50 on the project under the supervision of Walter Freeberg, General Superintendent. The general and subcontractors set up three frame, prefabricated Economy buildings on the job site for use as field offices, and for equipment and material storage.

For the city of Chicago, the design and construction of the airport and terminal building is under the direction of Ralph H. Burke, Airport Consultant, and represented on the project by R. E. Davis, Resident Engineer.

The late Otto K. Jelinek was Chief Planning Engineer, James P. Gallagher is General Construction Superintendent, Howard Kelly is Engineer of Construction, and Edwin A. Randall is Engineer of Design.

Gas-Fired Heaters

The complete line of usAIRco propeller, blower, and duct-type gas-fired heaters is now approved by the American Gas Association, according to a recent announcement by United States Air Conditioning Corp., 3319 Como Ave., S. E., Minneapolis 14, Minn. The company points out that these gas-fired heaters can be used for temporary or permanent installation. They are connected to a gas line and an electricity supply, they are provided with vents, and they are then ready for operation. The heaters are available with ratings from 50,000 to 200,000 btu per hour.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 107.

Hard-Metal Castings

A new booklet outlining the features and applications of Stoody castings of hard-metal alloys has been prepared by the Stoody Co., Whittier, Calif. The foreword to this 15-page booklet says, "It has become evident through the years that hard metals applied by welding provide an answer to most conditions in which severe wear is a factor, but there are many circumstances in which for one reason or another weld-ments of hard-facing alloys are inadequate or impractical. Frequently in such cases a part cast in its entirety of a hard-metal alloy provides superior design."

The booklet stresses Stoody's experience with wear-resistant metals and the background it provides for the production of alloy castings for operations involving extreme wear. It indicates some of the uses to which these castings may be put, the types available, and the methods of identification and ordering. The rest of the booklet is devoted to brief specifications and illustrations of specimens of the company's work.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 158.

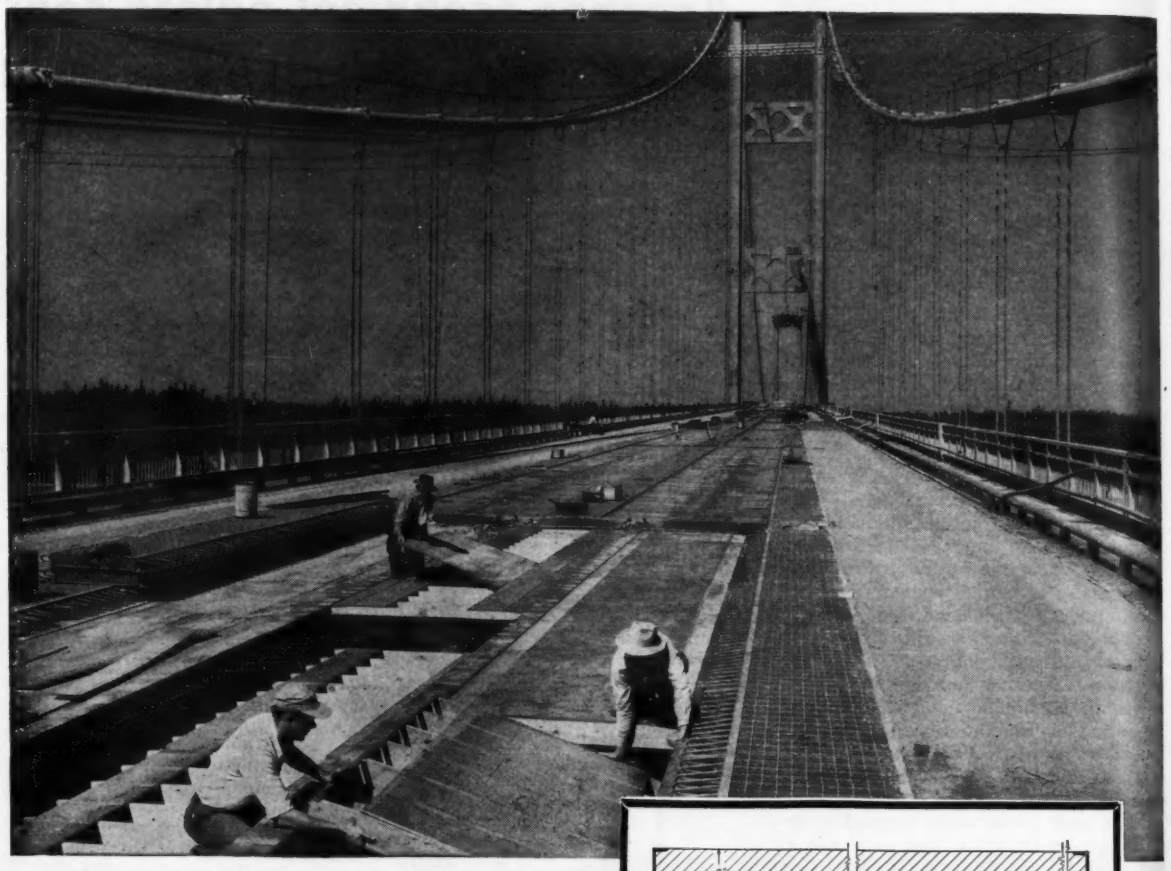
C. & E. M. Photo

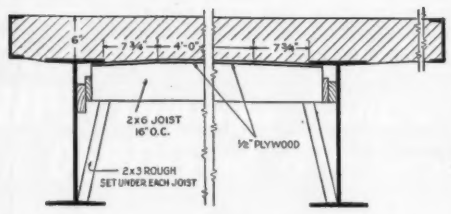
Great Lakes workmen cut chamfers on a C. H. & E. 10-inch-blade table saw.

Hydraulic-Scraper Catalog

A folder describing a 4-yard series of hydraulic scrapers has been prepared by LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa. This series includes the Model C-44 for short hauls with crawler tractors, and the Model C-42 for high-speed rubber-tired hauling. A detailed description and complete specifications are given for both models. On-the-job photographs show these units in action. The circular also includes an estimated-yardage table for the C-42.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 173.





Typical cross-section of roadway slab form. Entire roadway consists of four such sections and two sidewalk sections. The structure was built by the Washington State Bridge Authority. Charles E. Andrews, chairman and principal engineer. Dexter R. Smith was designing engineer. The new bridge replaces famed "Galloping Gertie"—lighter and narrower span which collapsed in a windstorm November 7, 1940.

On The New, Mile-Long Tacoma Narrows Bridge—

"Plywood Speeded Form Work All Along The Line"

THE MILE-LONG ROADWAY of the new Tacoma Narrows Bridge was formed against Douglas fir plywood because—in the words of Earl Starbard, job superintendent—"the forms had to be as tight as possible to prevent cement leakage, due to the great amount of steelwork below the road slab."

Starbard of Woodworth & Co., Tacoma, Washington—contractors for all concrete work—commented: "Plywood's large size reduced leakage to a minimum. That, plus the fact that plywood is light and easy to work, speeded form work all along the line."

Yes . . . when it comes to concrete form work, Douglas fir plywood does the big jobs—the difficult jobs—with speed and efficiency.

Douglas Fir Plywood

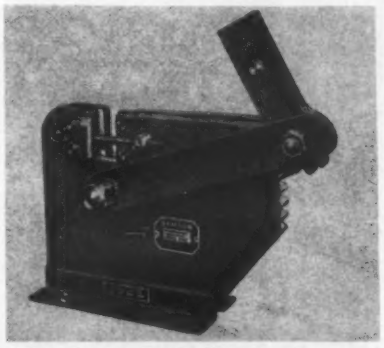
AMERICA'S

Material Handling With Flexible Slings

Woven-wire slings provide a strong, safe, flexible grip in handling pipe, steel beams, bar stock, machinery, and other heavy parts or assemblies, according to The Cambridge Wire Cloth Co., Cambridge, Md. The transverse looped-wire construction of its slings, the company says, provides strength and eliminates excessive wear, kinking, or tangling.

Cambridge woven-wire slings can be fabricated from any metal or alloy, including stainless steel, in standard widths from 3 to 30 inches and in standard lengths from 36 to 132 inches. The tempered-steel handles, which are attached to both ends of the sling, permit the use of either a choke or basket hitch around the material being handled. Load capacities of these slings range up to 8,000 pounds per inch of width.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 129.



The Samson No. 50-26 bar cutter will cut rounds up to 1 inch, squares up to ⅞ inch, and flats up to ½ x 3 inches.

Manual Bar Cutters

A new line of hand-lever bar cutters has been announced by Julius Blum & Co., Inc., 532-540 W. 22nd St., New York 11, N. Y. The Samson cutters have an unbreakable steel-plate frame, says the company, and will cut any size of rod from 1/16 inch up to their rated capacity without a change of knives. The knives are at the top of the machine; this is the most convenient location, the company says, because a number of bars may be laid down on top of the machine and dropped into the opening one by one.

Samson bar cutters are available in two sizes. No. 50-23 will cut rounds up to ⅞ inch, squares up to ¾ inch, and flats up to 7/16 x 2½ inches. No. 50-26 will cut rounds up to 1 inch, squares up to ⅞ inch, and flats up to ½ x 3 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 203.

Manages Reo Sales

On November 1, A. L. Struble took over the duties of General Sales Manager for Reo Motors, Inc., Lansing, Mich., succeeding R. D. Hilty, who is retiring. Before he came to Reo in 1949, Mr. Struble was with Trailmobile Co., and before that, with Fruehauf Trailer Co.

The power-driven Scythette gets at weeds in and around guardrails, fences, abutments, etc. It weighs 24 pounds.

Portable Scythe Cuts Hard-to-Get-At Weeds

A new power-driven portable scythe for cutting weeds and brush in normally inaccessible places has been developed by Hoffco, Inc., 411 N. 8th St., Richmond, Ind. The new Scythette weighs 24 pounds. A convenient over-the-shoulder strap makes it easy to carry and handle, the company points out. Its 20-inch cutter bar is powered by a 1¼-hp air-cooled engine, which requires approximately one gallon of gasoline for 6 operating hours.

The Scythette is designed for trimming and cutting weeds in and around guardrails, fences, bridge or overpass abutments, on rocky or uneven ground, steep slopes, etc. The 20-inch cutting blades are tempered and precision-ground.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 103.

Snowplow Care Described

Literature describing products for the care of snowplows has been prepared by the Norgahn Co., 406 Eleventh Ave., S., Wausau, Wis. The products described include Norgahn hydraulic fluid, wingslide compound, and moldboard glaze.

The company points out that by preventing snow from freezing to the moldboard the glaze reduces friction, cuts plowing costs, and increases efficiency. The product is easy to apply and will also prevent rust, the folder says.

The wingslide compound is designed to provide sludge-free lubrication for the wingslide. It will not adhere to metal or mix with water, says Norgahn.

As for Norgahn hydraulic fluid, the circulars explain that it withstands high pressures without foaming, that it inhibits rust, that it is acid-free, and that it keeps hydraulic systems operating under extreme temperature variation.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 231.

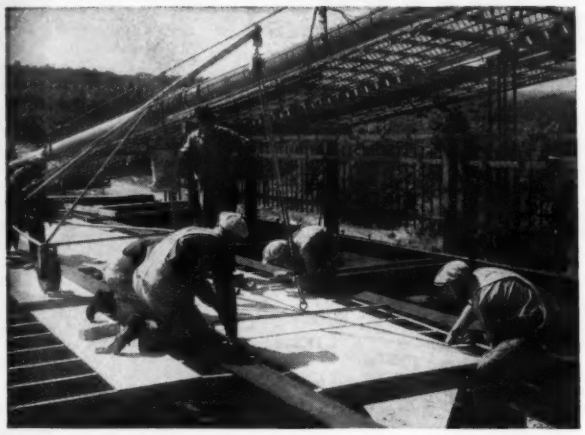
Mack Moves Kelso Ahead

A. R. Kelso has been elected Vice President of Mack Trucks, Inc., and named Vice President and a director of Mack Mfg. Corp., the company's manufacturing subsidiary. Mr. Kelso, from headquarters at Allentown, Pa., will be in charge of manufacturing and production at all Mack plants. He has been with the company since early this year when he joined as a production counsellor.

Barron at Wyeth-Scott

The Wyeth-Scott Co., Newark, Ohio, has named William Barron, 2541 Chesnut St., San Francisco, Factory Representative for northern California.

Contractors Report 15% Savings With Plywood Concrete Forms!



Workmen placing plywood concrete forms lengthwise across 2" x 6" joists between steel I-beams, using a small movable boom designed by Woodworth & Co. engineers. The mile-long reinforced concrete road slab was formed against ¾" Exterior plywood form panels. After concrete was cured, plywood forms were stripped from beneath with a traveling crane.

In addition to its use for roadway forms, plywood was utilized as form material for all above-ground concrete on the anchors, viaducts, bents and two toll houses—to insure smooth, easily-finished concrete surfaces. Almost a third of a million square feet of Douglas fir plywood were used for the span's concrete form work. Shown above: plywood forms for entire floor section of the bridge approach—slabs, girders and beams.

Large, Light, Strong Real Wood Panels

For additional data on Douglas fir plywood for concrete form work, write: Douglas Fir Plywood Association, Tacoma 2, Washington. Of particular interest are two booklets: "Concrete Forms of Douglas Fir Plywood" and "Handling PlyForm".

BUSIEST BUILDING MATERIAL

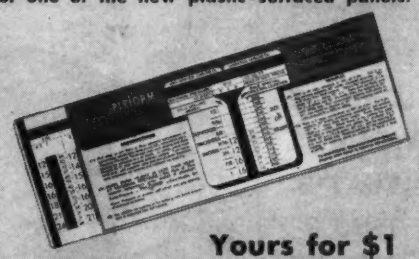
For Smooth, Fin-Free Concrete Surfaces...

PLYFORM

Concrete Form Panels

GENUINE DOUGLAS FIR PLYWOOD PLYFORM CONCRETE FORM PANEL INTERIOR-TYPE GRADE B-B D.F.P.A. INSPECTED

Smooth, fin-free surfaces . . . ease of handling . . . strength, rigidity, tightness . . . superior nail holding qualities . . . cost-cutting re-use factors—these are primary advantages of PlyForm. Highly moisture-resistant glues used in PlyForm panels permit multiple re-use (as many as 10 to 15 are not unusual). For the greatest possible panel re-use, however, specify Exterior-type Concrete Form grade of Douglas fir plywood—bonded with completely waterproof phenolic resin adhesive. For special architectural concrete, requiring the finest possible finish, the architect or contractor may specify Exterior-type or Interior-type Douglas fir plywood in grades having "A" face veneer—or one of the new plastic-surfaced panels.



Yours for $1

New Keely PlyForm calculator gives construction data for plywood forms, based on hourly rate of pour. Complete with leaflet, "Design Assumptions for New Keely Calculator." Send coupon now!

DOUGLAS FIR PLYWOOD ASSOCIATION
TACOMA 2, WASHINGTON (Good in USA only)

Please send me ..... Keely Calculators. I enclose $1.00 each to cover costs.

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Double Pavers Speed Divided Expressway

Austin Road Co. Doubles Up on Pavers and Batch Dumps To Lay Over 1,500 Linear Feet of 10-Inch Slab per Shift

✦ AUSTIN Road Co. has been at it again. Even in polite circles they admit the outfit has been "throwing a paving fit". At least 1,500 feet — sometimes 1,600 — of 10-inch reinforced-concrete slab 24 feet wide was considered a 9-hour-day's work by the same group of paving experts which recently set the Panhandle afire near Amarillo by laying 8,300 feet of widening in a shift.

They doubled up on pavers, purchased aggregate plants which would dump two batches at once, and built a special sled to move forms. The latter doubled speed and halved back injuries. It was a "double up" job, as anybody can testify.

"If they squeezed one more batch out of this plant they'd work me to death," said the state inspector who had to run the samples.

Big, genial T. J. "Jess" Insall, General Superintendent of the job, can't recall when speed was more important. The project was shut down for three months by rain, but when things opened up, everything moved fast. The job was organized like clockwork and moved as precisely. Peak production was its by-product.

Brand-New Highway

Austin Road Co. paved a 4.6-mile piece of what will eventually be a superhighway between Houston and Galveston. The $923,000 job was on U. S. 75 near LaMarque, about 15 miles north of Galveston. It included the construction of two overpasses, which were sublet to Charles Cohen.

The project consisted of two 24-foot lanes, separated by a 40-foot dividing strip. About 6,200 feet of the job was 10-inch reinforced pavement, and the remainder was 9-inch. Grading, and construction of a 6-inch shell and sand base, was done under a previous contract. When Austin Road Co. moved in last November, grading and base were all in and ready for pavement. In general, the base had been left ½ inch high.

With a 300-work-day limit and a rainy season due, Insall set his organization up to push ahead as rapidly as possible. When the rain hit, Insall didn't fight it. The job closed down for 90 days and then resumed at a faster pace than ever.

Forms and Subgrade

There were 600 sections of new 9-inch Blaw-Knox steel forms, with 10-inch bases, on the project. The 600 sections gave Insall 3,000 road-feet. This meant that he could set forms about 1,500 feet

(*Continued on next page*)

C. & E. M. Photo

How's this for a sweet setup on the Austin job? The bucket dumping is from a Multi-Foote 34-E in front. A spreader knocks the concrete down, men place the reinforcing mats, and a Koehring Twinbatch brings up the rear.

Peace on Earth,

Good Health to Children

For the sake of your children, buy and use Christmas Seals.

Thanks to Seals, children today have a far greater chance of escaping TB than you did.

To give them a still better chance, send your contribution today, please.

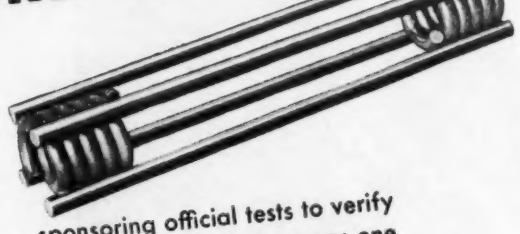
buy Christmas Seals

Because of the importance of the above message this space has been contributed by

Contractors & Engineers Monthly

ENGINEERED TYING DEVICES, ANCHORAGES and ACCESSORIES for CONCRETE CONSTRUCTION

IMPARTIAL TESTS PROVE STRENGTH OF RICHMOND TYSCRUS



Richmond pioneers again . . . sponsoring official tests to verify the rated safe loads of its Form-tying Products. In every one of 181 tests conducted by Charles E. Schaffner* at Brooklyn Polytechnic Institute, the results indicate a huge margin of safety, with ultimate strength far beyond the published safe load.

TYSCRU SIZE	PUBLISHED SAFE LOAD	REPORT OF ULTIMATE LOAD Test No. 1	Test No. 2
½" Dia.	6000	9,490 lbs.	10,590 lbs.
¾" Dia.	12000	19,720 lbs.	20,570 lbs.
1" Dia. 2 Strut	18000	27,580 lbs.	27,820 lbs.
1" Dia. 4 Strut	24000	37,930 lbs.	36,890 lbs.
1¼" Dia. 4 Strut	30000	55,270 lbs.	56,790 lbs.

*Assistant Professor of Civil Engineering

IT SAYS HERE "SAFE LOAD TIE VALUES". WHAT'S THAT?

OH THAT MEANS RICHMOND SUGGESTS THE USE OF THEIR TIES TO THOSE SAFE LOAD STRENGTHS EVEN THOUGH THE ULTIMATE STRENGTH IS MORE THAN HALF AGAIN AS MUCH. THEIR 30,000 LB. SAFE LOAD TYSCRU TESTS ULTIMATE STRENGTH UP TO 56,000 LBS.

RICHMOND KNOW-HOW—DEPENDABILITY—SERVICE—ESTIMATES & JOB PLANNING

C. & E. M. Photo
Jesse Washington, Austin's expert sledge man, drives a pin in the Blaw-Knox forms. Who ever saw a prettier curve in steel forms?

ahead of the paving machines.

"With a double lineup of machines you've got to stay a long way ahead," Insall said. "They've got to have a place to go, to let the finishing bridges get done with their day's work."

Form trench was prepared by a Cleveland Formgrader, working to a tight string line referenced in from surveyor's hubs. The form-handling crew was small. Two form setters handled all form placing. There was a form liner, a tractor operator, maintainer operator, and several laborers.

Insall worked out an improved, if simple, rig to handle the heavy 200-pound form sections, which were made even heavier by the addition of a 1-inch plank and 6 steel bolts at the bottom. These were necessary to get the 10-inch thickness. He noticed that there were quite a few strained backs when men threw the forms to a truck bed. Winches were too slow.

A 22-foot sled, built last winter, solved the problem. It is mounted on steel H-beam skids, and has a box in the center for form pins. Its deck is close to the ground, and men could handle the forms without having to lift them more than a foot or two. The sled has decks for two piles of forms, and will haul about 800 feet at a time. Pulled by an Allis-Chalmers LO tractor, this sled speeded the formwork and cut back injuries in half.

The first operation after the forms were set was final dressing of the shell base. A Caterpillar RD7 with an Austin heavy-duty planer moved along and scooped up the excess material. When it pulled a sufficient amount ahead to make a truckload, the material was scooped up by a Bucyrus-Erie Dozer-Shovel. A Caterpillar motor grader was also used on this work.

The base had its required compaction prior to the time Austin Road Co. moved in, but there was nevertheless an Allis-Chalmers rubber-tired tractor with a pneumatic roller to compact any fill areas which needed it. This machine often rolled the subgrade simply to improve it if possible. Light sprinkling was done by water trucks and a hose.

Frequent Pavement Joints

When the subgrade was finally prepared, men moved in to set the expansion joints. These consisted of 1-inch redwood boards with 26 Star Lugs in each 24-foot joint. The top of each joint was capped by a metal device which was removed when the joint was finished.

Warping, or contraction, joints are spaced every 15 feet. They were cut from a bridge behind the last mechanical finisher, and consisted of a thin strip of 3-inch mastic material. The longitudinal plane-of-weakness joint was formed by the Keyes cut-and-cover method, and steel dowels in this joint were wired onto the reinforcing-steel

(Continued on next page)

C. & E. M. Photo
General Superintendent T. J. Insall and State Highway Inspector R. M. Olson talk concrete mixes at the batch plant. Directly behind them is a Johnson aggregate batcher being fed by Lorain and Northwest clamshells.

A MERCURY CLUTCH PREVENTS STALLING IN THE PINCHES

INSURE LOAD-FREE STARTING AND IDLING

If your construction equipment and machinery is powered by a gasoline engine, insure its trouble-free performance at all times by installing a Mercury Automatic Clutch between the engine and the load. The engine starts easily, picks up the load smoothly, and does not stall when idling or when overloaded.

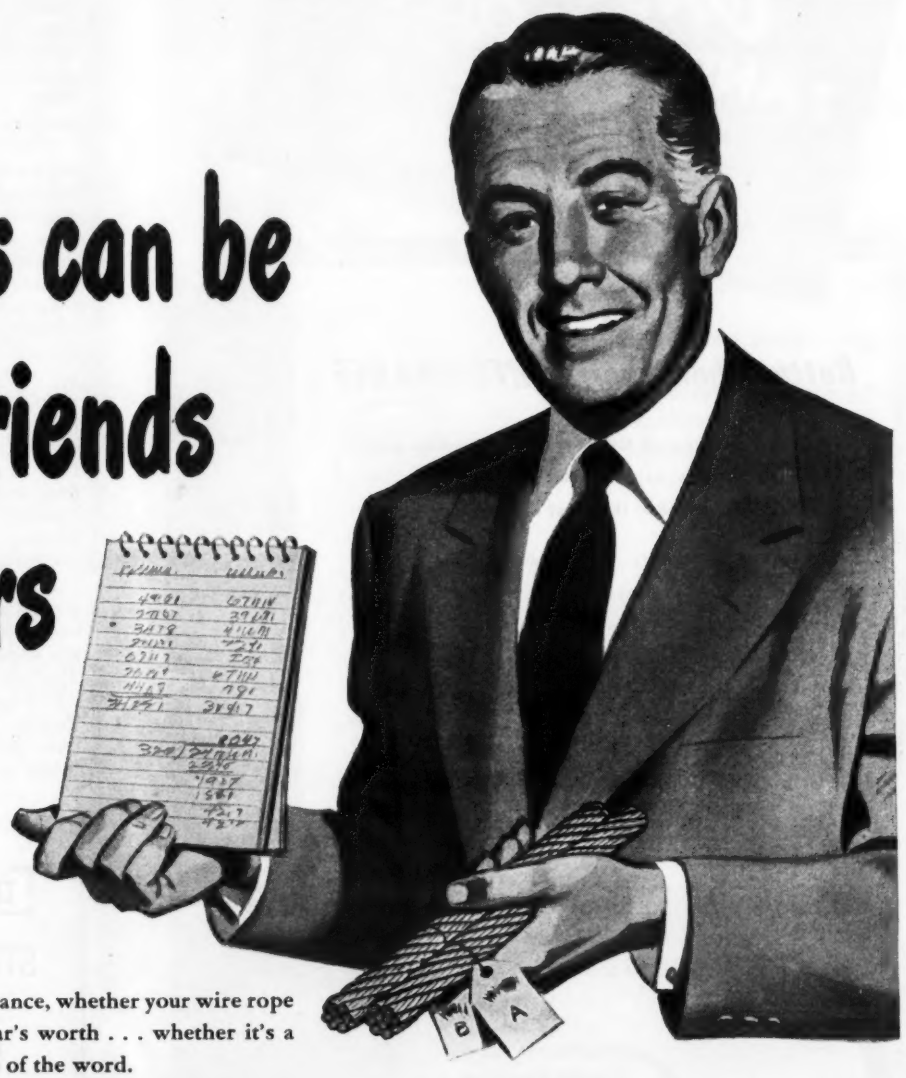
For all original equipment using gasoline engines . . . or electric motors...investigate the advantages of a Mercury Automatic Clutch.

Write for Catalog 216-G2

MERCURY CLUTCH DIVISION

AUTOMATIC STEEL PRODUCTS INC. · CANTON 6 · OHIO

Figures can be good friends of yours



They can tell you, for instance, whether your wire rope is giving you a big dollar's worth . . . whether it's a bargain in the true sense of the word.

They can tell you the total amount of work it does in its life, and the cost per unit of work—the only *true* cost. Bethlehem strongly suggests you keep figures on wire-rope performance, so that you will know at all times which brand of rope is doing the best, most economical job for you.

Obviously, we feel that Bethlehem rope will stand out in any such comparisons. We welcome comparisons as a means of proving the basic economy of Bethlehem rope—economy every user can prove with a simple system of records.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

LET YOUR RECORDS TELL YOU!

Double Pavers Speed Divided Expressway

(*Continued from preceding page*)

mats before they were placed.

Paving Goes Fast

Concrete went along exceptionally fast, because two pavers were used, one on each side of the forms. The highway passes through flat terrain and side-slopes and ditches are shallow. It was an ideal setup for the use of two machines.

The first paver in the line was a MultiFoote 34-E. It mixed and laid the first 5 inches of the slab. Then a Jaeger-Lakewood spreader passed over the fresh concrete and leveled it down to a uniform thickness of 5 inches. The mats of reinforcing mesh measure 11½ x 14½ feet, and four workmen brought them in just behind the first spreader.

C. & E. M. Photo

This little form sled was worth its weight in gold. Close to the ground, it reduced back injuries and cut form-handling costs.

The second paver, on the opposite side of the forms, was a Koehring Twinbatch 34-E. It mixed and placed the upper half of the slab. The first spreader did not have to move back, for the spreader arrangement was also doubled. The second Jaeger-Lakewood finishing machine worked behind the second paver.

Mixing water came to the pavers from 1,000-gallon trailers, which the machines pulled along. The trailers were replenished by two 1,000-gallon tank trucks. Water was plentiful, and a small dike along a borrow ditch, with a 3-inch CMC pump, developed an adequate supply.

Concrete was spread across the grade by paver buckets. The expansion joints received a thorough vibration from a gas-powered machine. Edges along the steel forms were also vibrated and spaded.

Behind the second finishing machine was a Koehring mechanical finisher, which put on the first dressing and shaped the 1½-inch crown. After it had finished, the slab got rather extensive attention from cement finishers. Two men with long-handled bullfloats dressed the surface and pulled a rubber hose to move excess laitance away. The final finish was pulled by a 6-inch canvas belt, to leave a diagonal nonskid surface.

Contraction joints were cut just behind the second spreader. After the concrete had taken on its initial set, the expansion-joint caps were removed and the joints were finished by edging tools. The job which Insall's men did is one which had to be seen to be appreciated. Two of the finishers who did this work have followed him for 23 years, and Insall is exceedingly proud of them. Finished joints are straight and level.

A 6-inch black oxide stripe was also placed with the paving, using a shop-built bridge. Sisalkraft 72-ounce paper was unrolled and weighted with dirt to cure the slab. It usually stayed in place about 3 days, but the forms were always pulled and moved ahead within 24 hours of the time they were filled. The expansion joints were poured to within ½ inch of the slab surface with rubber-asphalt joint filler, usually about 7 days after the time they were made. This allowed time for the joint to dry after the curing paper was taken off.

Double Batching Hoppers

Steady runs of 1,500 to 1,600 feet per 9-hour day can be attributed in large measure to a batch-plant arrangement which permitted two concrete batches to be dumped at one time. Both the Johnson sand-aggregate batcher and the Heltzel 300-barrel bulk-cement bins were equipped to weigh and dump two batches simultaneously.

(*Concluded on next page*)

GALION
TANDEM ROLLERS
Give you Advanced Features
for
Better-Than-Ever PERFORMANCE

Some of the advanced GALION features which assure easy and precise control, efficient operation, easy servicing, long life, and the finest finished surfaces are:

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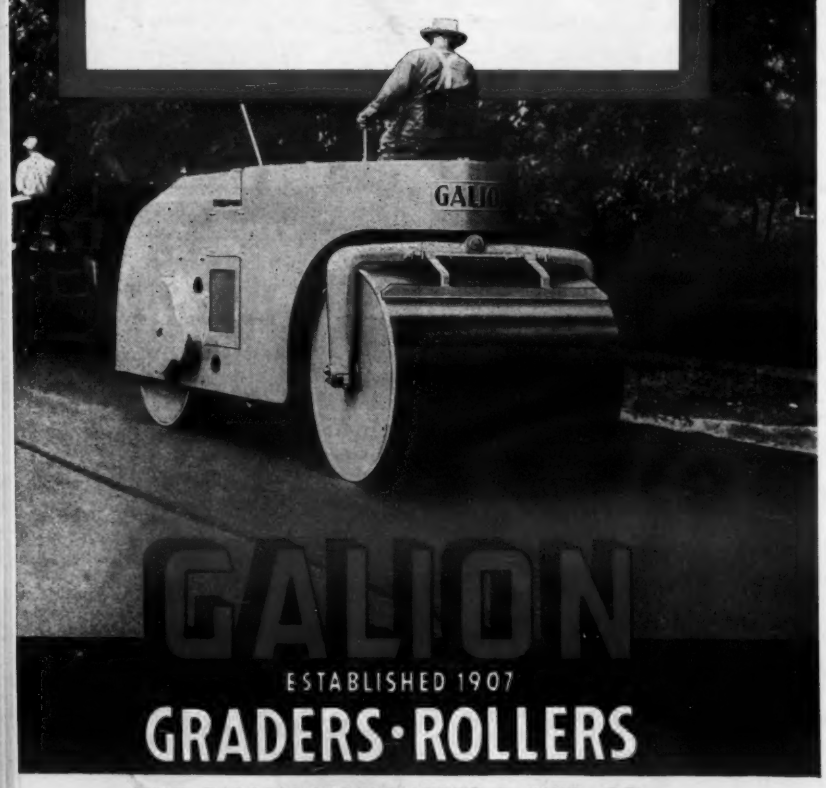

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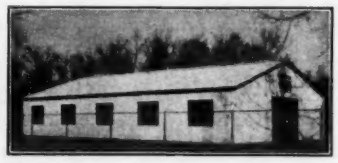

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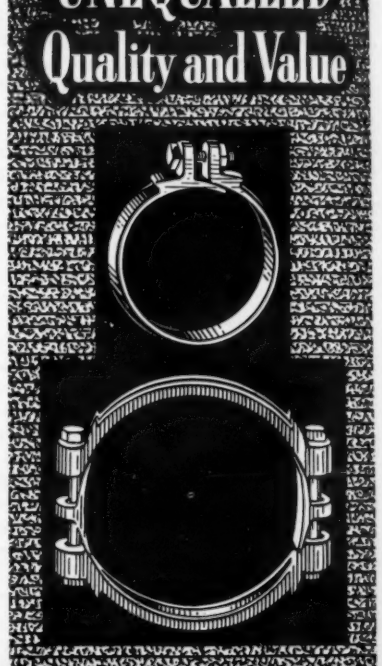

"KING" CLAMPS
Single Bolt
Double Bolt

Made of malleable iron, to provide greater strength and durability than any other band type clamps. Production in vast quantities is never allowed to depreciate their superior quality or utility values. Cadmium plated, rustproof.

Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods.

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C. & E. M. Photo
To cure the slab these Austin men unroll Sisalkraft paper on it and weight it down with dirt.

One of South Texas' best-known materials companies, TCM, kept the sand and aggregates rolling in at the rate of 26 carloads a day. TCM means Texas Construction Material Co. of Houston. Rock aggregate, 2½-inch maximum size, was shipped to the job from Alleyton, while sand originated at Eagle Lake. Trinity bulk cement came from Houston.

Sand was stockpiled on the west side of the batch plant, and the one size of rock was on the other. A Northwest machine with a 1½-yard Owen clam often unloaded 26 cars a day, and kept the rock bin charged on the batch plant. A Lorain ¾-yard Moto-Crane handled the sand. On an average day the plant handled 24 carloads of gravel, 14 cars of sand, and 4 cars of cement.

The Heltzel cement plant was about 500 feet from the aggregate plant. Both plants, incidentally, were set up on a spur line inside the old camp grounds of Camp Wallace. A track hopper and screw-feed conveyor took the bulk cement from the hopper-bottom cars and stored it for use.

Ordinarily a fleet of 20 batch trucks, each hauling two 1⅓-yard batches, was needed for the average 4-mile haul. These trucks were rented, and included many makes. Each truck backed under the Johnson plant and received two batches at once. It then moved down to the cement plant and two batches of that material were put on top of the sand and aggregate. The trucks were covered by a tarpaulin to keep the cement from blowing.

Insall started paving from the north end, so he could use the finished pavement as soon as possible to speed his batch trucks. A haul road was also maintained along the shoulders for use when pavement was not available.

Among key contractor officials, foremen, workmen, equipment operators, and state highway inspectors, there was not one dissenter to the statement that this was the best-organized smoothest-rolling project in the state.

Personnel

D. C. Greer heads up the Texas Highway Department under which the project was designed and supervised. Joe Estill was the Resident Engineer and O. P. "One Price Only" Owens was the Pavement Inspector.

The Austin Road Co. is headed by Tyree L. Bell, President, and the following foremen working under Jess Insall deserve all the credit in the world for making the work go so fast and efficiently: J. D. Gandy, Paving; Fed Birdwell, Subgrade; F. C. Courtney, Curing; Bob Anderson, Material Yard; Larue Jones, Dirtwork; C. O. Matlock, Drain Pipe; and E. N. Morris and E. A. Taylor in charge of the office.

The new highway, when completed, will eventually tie in to the Houston Expressway and will continue to Galveston, speeding an ever-increasing volume of traffic between the two cities.

Beckwith Leaves Quijada

Doran H. Beckwith, Sales Manager for Quijada Tool Co., Inc., Los Angeles manufacturer of pipe-threading and cutting tools, has returned to active duty with the Army. Roland V. Dickenson takes his place. Mr. Dickenson was formerly Sales Manager of the San Gabriel Construction Co., San Gabriel, Calif.

New Tractor Pusher

A new pusher for the Allis-Chalmers HD-19 tractor has been announced by The Baker Mfg. Co., Springfield, Ill. Available as a complete unit or as an attachment, it weighs approximately 725 pounds complete, is heavily reinforced, sturdily constructed, and designed to work with practically all types of scraper push plates. It is said to float with the pusher block of the scraper, whether it be high on a fill or low in a deep cut.

The new Baker pusher for Allis-Chalmers HD-19 tractors. It floats along with the pusher block of the scraper.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 151.

Catalog on Safety Products

A new 64-page catalog containing complete product information and selector tables on eye and respiratory safety equipment has been offered by Willson Products, Inc., Reading, Pa. Though designed for a wide range of application in industry, many of these products will be of interest to construction men: abrasive blasting helmets, air-line accessories, face shields, protective goggles and lenses, dust respirators, spectacles, and welding hand shields and helmets, for example. All the equipment is fully described and illustrated.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 211.

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assured by higher speeds and outstanding mechanical excellence!

Check these Features!

- All friction surfaces *Superfinished*
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THE FACT that a higher speed engine can out-perform all others has long been established. Today, after years of field operation in every type of gasoline powered equipment, it has been conclusively shown that Chrysler Industrial Engines *out-last* and *out-economize* all other similarly rated engines. The reason lies in the outstanding achievements of Chrysler engineering and Chrysler research in higher alloy steels. And because of Chrysler mass production Chrysler Industrial Engines *cost less!* See your Chrysler Industrial Engine Dealer, or write us. ***Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.***

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Service Available Everywhere

It adds and subtracts fractions and converts them to decimal equivalents—the user just dials for the answer. It's called the Fractionator.

Fraction Computer Dials Like a Phone

A new circular scale for adding or subtracting fractions in units of 1/64ths has been announced by Charles E. Wells, P. O. Box 25, Montrose, Calif. The Fractionator is approximately 6 inches in diameter and consists of three disks. The scale on the outer disk shows fractions in 1/32 increments and the inner disk indicates fractions in 1/64ths. The center disk revolves and is dialed with a pencil point, exactly like a dial telephone.

Here is how the Fractionator works. To add fractions—for example, 3/16, 5/32, 9/64, and 1/4—dial the center disk clockwise as you would a telephone number, using the designated fractions shown in the upper portion on the inner and outer disks. The answer automatically appears in the answer slot, together with its decimal equivalent. To subtract 1/4, 3/64, and 9/32 from this figure, for example, dial the disk counter-clockwise, using the designated fractions appearing in the lower half of the circle. The inventor claims that the Fractionator is 100 per cent accurate in adding and subtracting fractions and in converting them to their complete decimal equivalents.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 228.

New Job-Data Booklet On Lightweight Aggregate

A new 50-page Permalite Job Data Brochure, completely illustrated, is now available from Great Lakes Carbon Corp., Building Products Division, 18 E. 48th St., New York 17, N. Y., or 612 S. Flower St., Los Angeles 17, Calif. It covers typical Permalite jobs throughout the country, giving such job data as the names of the architect, general contractor, and subcontractor, and the amount of Permalite and how it was used.

Big jobs such as the Park Forest Homes, Chicago, Ill., requiring 154,000 bags of Permalite, and little jobs such as a 5-room house requiring 40 bags of Permalite, are cited. Examples are included of Permalite's use in base-coat plaster, plaster fireproofing of structural steel, acoustical plaster, and lightweight insulating concrete for roof decks, floor fills, and curtain walls.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 138.

Morris E. Fonda to Head Soil Conservation Society

Morris E. Fonda of Detroit, widely known conservationist and publicist, has been elected President of the Soil Conservation Society of America. A member of the Public Relations Department of Harry Ferguson, Inc., he has served with the National Association of Soil Conservation Districts, Friends of the Land, and the Federal Department of Agriculture. He has worked with public and private interests in educating people to the most effective methods for land and water conservation.

Truck Mixers and Agitators

A new bulletin, No. R-1700-B3, describing current models of Hi-Up Worthington-Ransome truck mixers and agitators is announced by Worthington Pump & Machinery Corp., Harrison, N. J.

For central mixing plants, the following mixers are described: an 84-S which gives a capacity load for a 3-yard Hi-Up agitator; two 56-S models (or one 126-S) for a 4¼-yard agitator; and two 84-S mixers for a 6⅛ or a 7⅜-yard agitator.

Specifications, line drawings, and pictures of the following sizes of truck mixers are also included in the bulletin: 3-cubic-yard mixer to service a 4¼-yard agitator; a 4½-yard mixer to service a 6⅛-yard agitator; and a 5½-cubic-yard mixer to service a 7⅜-cubic-yard agitator.

In the 20-page bulletin are pictures and explanations of such features as the main frame, transmission, clutches, trunnion bearings, chain drive, water system, water tank and flush tank, drum head, drum rollers, drip ring, hopper, seal, and clutches. Manufacturing techniques are also discussed.

This literature may be obtained from the company or by using the Request Card at page 16. Circle No. 195.

Data on Wire-Rope Slings

A broadside describing the Tuffy slings has been offered by Union Wire Rope Corp., Kansas City 3, Mo. The 9-part interlacing construction of this rope gives extra flexibility and long life, the literature says. The slings can be furnished with the regular eyesplice shielded with a metal fitting or with slip-through thimbles to fit crane hooks. Thimbles may be obtained for any of the standard eye sizes.

The broadside describes the Tuffy general-purpose sling, a two-part bridle sling, choker-type sling, 3 and 4-part bridle slings, and the double-loop bridle sling. Available sizes and safe load capacities are listed for all of the products. The company points out that the slings are proof-tested to twice their safe working-load limit.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 190.

TYPICAL of dozens of installations, this Model 5050 Cedarapids Double Impeller Impact Breaker is producing tops in tonnage—and at lower cost. In a dolomite installation in Ohio, one operator claimed 720 tons per hour using two 150 H.P. Motors. In Florida, one Cedarapids Breaker is doing the work of three previous crushers in reducing a very abrasive coral rock down to minus 1". Ask your Cedarapids distributor for more field-proved facts on Double Impeller Impact Breaker action.

THE IOWA LINE *of Material Handling Equipment Includes:*

ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • BUCKET ELEVATORS • VIBRATOR AND REVOLVING SCREE
UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE AND GRAVEL PLA
• REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • HAMMERMILLS • DRAG SCRAPER TANKS • WASH
PLANTS • SOIL COMPACTION UNITS • STEEL TRUCKS AND TRAILERS • KUBIT IMPACT BREAKERS • DOUBLE IMPELLER IMPACT BREAK

Overall or Spot Heating With a Forced-Aid Heater

A new bulletin describing the Hy-Lo Hotshot forced-air portable heater has been announced by Scheu Products Co., Ltd., Upland, Calif. This unit, the literature points out, will provide 300,000 Btu's per hour with a consumption of 4¼ gallons of fuel oil.

A cutaway illustration of the portable heater shows the inside and outside features. Detailed specifications are included. Job applications listed in the folder include space and spot heating, preheating, thawing, ventilating, curing, and drying. The unit may be powered by a gasoline engine or electric motor, and it provides 1,600 cubic feet of air per minute at a temperature of 200 to 300 degrees F. Mounted on pneumatic-tired wheels, the unit may be moved to any position on the job.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 212.

Split-Thrust Washers Cut Replacement Cost

"You don't have to dismantle machines to install new thrust bearings" is the keynote of new literature prepared by Saginaw Bearing Co., 821 S. Water St., Saginaw, Mich. It points out that the Sabeco split-thrust washers are placed over the shaft and locked with a safety key. This saves both the repair time of the maintenance man and the "down time" of the machine.

The circular points out that Sabeco split-thrust bearings are available in a score of standard sizes as well as special sizes. It also points out that the Sabeco bronze used in these bearings is designed for long life, since it contains a maximum of only 0.2 total impurities.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 223.

Synchro-Start Builds

Synchro-Start Products, Inc., Chicago, Ill., has begun construction of a factory building in Skokie, Ill. It will house the main offices and final assembly; fabrication will continue in the present building. The main offices will move to Skokie about February 1, 1951.

The Mott hammer knife mower mounts on the Mead Mighty Mouse tractor to cut, shred, and spread brush or grass over the ground in a fine mulch.

Hammer Knife Mower For a Small Tractor

A new hammer knife mower which cuts, shreds, and spreads material evenly over the ground, making a fine mulch which will retain moisture, has been announced by Mead Specialties Co., Dept. HK-80, 4114 N. Knox Ave., Chicago 41, Ill. One cut through the heavy grass or brush leaves a smooth surface of any desired height, the company says.

Hinged knives whirl with centrifugal force from a center shaft to give long cutting life at small upkeep cost, even in rock and rubbish, according to the manufacturer. New knives can be replaced in a few minutes by removing a cotter pin and hinge pin at negligible cost.

The Mott hammer knife mower is available in a 4-foot width, separately powered by a 5-hp motor to give a constant speed in the heaviest cutting. In addition to its use for mowing, the Mead machine may be used for light bulldozing and grading. The mower mounts on the front of Mead's Mighty Mouse tractor, and may be used for roadside mowing where the going is tough.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 185.

No Shovel-Tail Swing On Half-Yard Excavator

A 16-page catalog describing the Badger ¾-swing excavator has been offered by Austin-Western Co., Aurora, Ill. It points out that this unit is fully convertible to shovel, clamshell, crane, dragline, trench hoe, skimmer, and pile driver. It may be powered by a gasoline, diesel, or electric power source. The literature explains that the ¾-swing design, where only the front end turns, provides faster operation.

Other features highlighted in the brochure include greater visibility, extra dumping height, and extra reach for the ½-yard buckets. A number of on-the-job photos show how the "no-tail-swing" feature enables the Badger to work in close quarters and how this crawler excavator may be mounted on wheels under its own power for quick transportation between jobs. The same mount used for the Badger may be attached to a low-bed trailer frame for transporting other pieces of machinery.

The back portion of the catalog contains a detailed description of the compotent working units of this excavator: frame and crawlers, turntable, crowd and swing mechanism, turntable assembly, boom and dipper stick, shovel bucket, and the various power sources. Complete specifications and tables of working ranges for shovel, clamshell, dragline, crane, or back-hoe operation are provided.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 174.

Gwynne Rejoins Reynolds

J. M. Gwynne has been appointed Manager of Engineering Sales, Building Products Section, Parts Division, Reynolds Metals Co., Louisville, Ky. He was formerly Executive Vice President and General Manager of Metal Arts Mfg. Co., of Atlanta, Ga.

PRODUCTION

Ideal Cubical Shaped Aggregate

ith Cedarapids

DOUBLE IMPELLER IMPACT BREAKER

(formerly made by New Holland)

HERE'S the unit that will give you greater hourly tonnage capacities, better quality and shape of finished products, lower horsepower per ton of aggregate produced and a higher reduction ratio.

The Cedarapids Model 5050 Double Impeller Impact Breaker can produce up to 400 tons per hour of minus 4" clean, cubical aggregate required in so many specifications today. The smaller models—4040, 3030 and 2020 can deliver from 75 tons per hour—up, depending on the material fed, horsepower used and size product desired.

You can use the Cedarapids Double Impeller Impact Breakers for basalt, cinders, tuff, perlite, limestone, coral rock, sandstone, coal, copper ore, lead zinc ore, low grade iron ore, or dozens of other materials with a relatively low silica content. They will operate in wet, sticky material that jams, packs or clogs conventional machines.

U. S. Pat. No. 2,373,691
2,486,421
Canadian Pat. No. 439,371
Other Patents Pending

et up your plants NOW— for stepped up capacity

PUT *your* plant in the big money picture with the high capacity production made possible by the Cedarapids Double Impeller Impact Breaker. Think of the profit in producing greater hourly tonnage of a better product . . . and at the same time reducing your power and maintenance costs, with a lower plant investment! The illustration at the right shows how it is done . . .

Rock is broken by impact (not crushed) into the ideal cubical aggregate required in so many specifications. And a high percentage of the material is *broken in mid-air* by rock striking rock! Result . . . the Breaker can be fed larger rocks, handles greater volume, reduces pit run material to specification size *in one pass.* This extremely high ratio of reduction reduces your plant investment because it eliminates the need for much accessory equipment such as screens, conveyors, secondary crushers, etc.

Stone broken in mid-air requires no power . . . you save on horsepower. Approximately 50% less contact of stone on metal keeps replacement and maintenance costs low.

Get this big volume, low cost set-up operating in your plant now!

OWA MANUFACTURING COMPANY

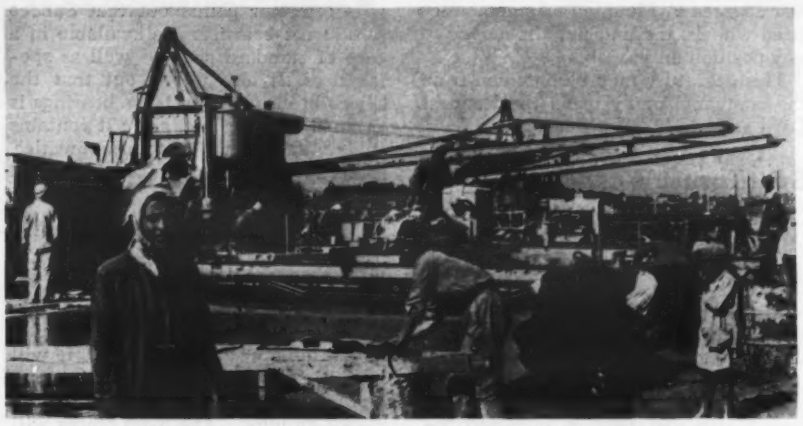
Cedar Rapids, Iowa, U. S. A.

Cedarapids Built by IOWA

American Equipment Builds Beirut Airport

Construction of the airport of Beirut, capital city of Lebanon, was a pioneering job in that part of the world for assembly-line methods of construction and high-speed precision equipment. Some 750,000 square yards of 10 and 12-inch concrete paving for runways, taxiways, connecting strips, and parking aprons were laid by this past summer to complete the largest and best-equipped air terminal in the Near, Far, or Middle East.

A paving setup that would be relatively troubleproof was selected for the job, and all possible operations were mechanized. Equipment was purchased through an American exporting firm and consisted of a Blaw-Knox paving package: two MultiFoote Duomix 34-E pavers, one Model SD 25-foot spreader with vibrator, one Model XE finishing machine adjustable to 25-foot width, one 3-compartment aggregate bin with scales, and several thousand feet of 12-inch steel paving forms. Two Bay City cranes with Blaw-Knox clamshell buckets and a Blaw-Knox 14-S mixer were also used on the job.



Lebanese workmen learn to use the West's construction tools on the Beirut Airport project. Here two MultiFoote Duomix 34-E pavers are followed by a Blaw-Knox Model SD 25-foot spreader and a Model XE finishing machine.

The training of operators for the machines fell to six American engineers who assisted the airport technical adviser for three months, and a Blaw-Knox service engineer who was hired for a period of one year. He trained the men on the project in the proper adjustment, repair, and maintenance of the equipment.

Concrete placing began in October, 1949. During the first few days the paver production was brought up gradually from a very poor beginning, caused by the inexperience of the operators and improper adjustment and maintenance of the machines, to approximately 820 cubic yards per 7-hour day. After a few changes in procedure, and after more intensified training, approximately 1,000 cubic yards per 8½-hour day were poured. The largest day's run totaled 1,005 concrete batches of 37.4 cubic feet.

This progress compares favorably with U. S. production, considering that the work was done with Lebanese personnel who were handling new types of equipment, and who had absolutely no background for the work.

By July of this year, the Beirut Airport was serving 4-motored planes for such carriers as Pan-American, Air France, Swiss Air, and several smaller lines.

Brake Adjustment

A new tool for adjusting Wagner hydraulic brakes on late-model International trucks has been announced by the Owatonna Tool Co., 381 N. Cedar St., Owatonna, Minn. It is designed for time-saving work on brakes FR, FR25, and FR25D, and is built to withstand hard use.

Further information on tool No. H-25 may be secured from the company. Or use the Request Card at page 16. Circle No. 126.

Calaveras Cement Expands

Calaveras Cement Co. has invested $600,000 in new equipment at its San Andreas, Calif., plant so that it can continue to produce at full capacity during the slack winter months and build up cement inventories for distribution when demand increases again in the spring. The company completed a $2,500,000 postwar plant-expansion program less than a year ago.

Generating-Plant Catalog

Literature on electric generating plants has been prepared by Kato Engineering Co., 1415 First Ave., Mankato, Minn. The Katolight plants are made in gasoline-engine-driven models, both air-cooled and water-cooled, to provide capacities from 200 to 25,000 watts. Generator and engine specifications are given for 21 of the standard models manufactured by this company. Each model is fully illustrated and described.

The literature points out that the Katolight generating plants may be used for standby or continuous service. The air-cooled units, available in sizes up to 15 kw, are recommended by the company for standby or seasonal applications. The lower-speed water-cooled models are designed for daily year-round service, and range in sizes from 3.5 to 25 kw. The catalog describes the operating characteristics of the plants, their installation, and accessories available with them.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 215.

● You don't send a beach out to the cleaners. But take a look at this beach being dry cleaned. With Waukesha power! The top layer of sand, to a depth of nine inches, is being scooped up and screened . . . broken glass and other dangerous debris removed and articles of value recovered . . . and the clean sand, fluffed and aerated, is being replaced—by the *Beach Sanitizer* built by Sanitized Beaches, Inc.—a division of Stephens-Adamson Mfg. Co., Aurora, Ill. Powered by its Waukesha XAHU Gasoline Power Unit—4-cyl., 3⅝-in. x 4½-in., 186 cu. in. displacement; 43 hp. max. at 2000 rpm.—the *Beach Sanitizer* cleans a 6½-ft. wide strip of beach at a speed up to 1½ m.p.h., handling 2000-3500 sq. yds. of sand an hour. For details of this and other Waukesha Industrial Power Units, 8 hp. to 400 hp., send for Bulletin 1408.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS., NEW YORK, TULSA, LOS ANGELES

WAUKESHA POWER

Model XAHU

Vulcan Tools

A complete line for every type of Rock Drill, Pavement Breaker and Clay Digger.

Vulcan Tool Manufacturing Co.

35-43 Liberty Street, Quincy, Mass.

Branch Offices and Warehouse Stocks:

74 Murray St. New York, N. Y.

34 No. Clinton St. Chicago, Ill.

for low-cost pumping

JAEGER invites 5-way comparison with any other pump

1: Priming speed
2: Vacuum, capacity and pressure
3: Gallons water moved per gallon of fuel
4: Self-cleaning ability
5: Hours of service per dollar invested

Latest type 2" and 3": Compact heavy duty units with weather-shielded engines.

4" to 10" Portables: Specially housed for easy access to engines, larger fuel tanks.

Aluminum Pumps: with replaceable liners, stainless steel shell fitting. 1½", 60 lbs., up to 5700 gph.—2", 105 lbs., 9000 gph.

Jetting Pumps: For pressures to 275 lbs. Also 2" to 8" pressure pumps for supply work. Diaphragm pumps for sand and mud.

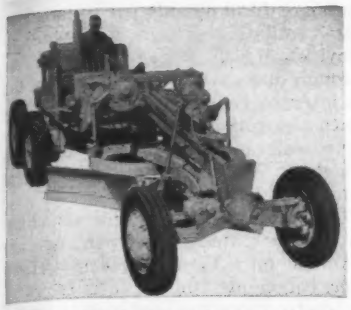
Ask for Complete Pump Catalog

THE JAEGER MACHINE CO.

Columbus 16, Ohio

Distributors in 130 Cities of U. S., Canada

AIR COMPRESSORS • MIXERS
HOISTS • AGGREGATE SPREADERS
BITUMINOUS PAVERS
CONCRETE SPREADERS • FINISHERS



A 70-hp diesel powers the new Adams No. 312 motor grader.

New Grading Machines

A 70-hp diesel engine powers the new No. 312 motor grader announced by J. D. Adams Mfg. Co., 217 S. Belmont Ave., Indianapolis, Ind. The company points out that with over 12,800 pounds of weight on the rear wheels of the grader, ample traction is provided to take full advantage of the 70-hp engine. Features claimed for the new No. 312 include full-floating rear axle, 8 overlapping forward speeds, fast mechanically operated controls, a 12-foot blade, and a high-arch front axle. Optional equipment includes hydraulic-mechanical power steering, a V-type snowplow, snow wing, and a bulldozer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 229.

Many Uses for Air Photos

Highway departments, contractors, engineers, and city planners have many uses for aerial photographs. A new 16-page illustrated brochure prepared by Abrams Aerial Survey Corp., 606 E. Shiawassee St., Lansing 1, Mich., illustrates most of these.

It points out that aerial surveys offer complete information, dependable accuracy, and economy in data collection and correlation. The booklet illustrates and points to the application for mosaics, atlas sheets, contact prints, planimetric maps, reconnaissance strip maps, topographic maps, and aerial obliques. It also provides a brief look at the Abrams organization.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 170.

Booklet on Electric Hoists

A 20-page bulletin covering the new P&H Zip-Lift electric hoists is now available from Harnischfeger Corp., Hoist Division, 4400 W. National Ave., Milwaukee 14, Wis. Printed in two colors and illustrated with large installation pictures, the bulletin contains full descriptions and specifications of all models. A large cutaway drawing reproduced on the two center pages shows construction features of these electric hoists.

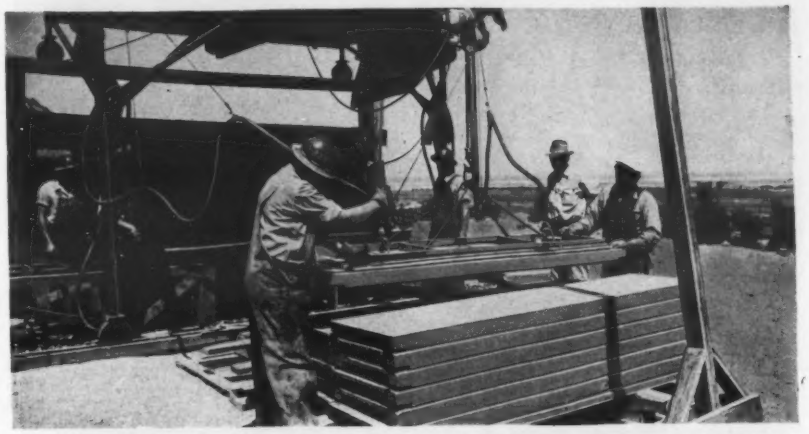
This literature may be obtained from the company by requesting Bulletin H-20, or by using the Request Card at page 16. Circle No. 108.

Lubricating Systems

A new 4-page folder describing Lincoln heavy-duty lubricating rigs for contractors has been prepared by the Lincoln Engineering Co., 5701 Natural Bridge Ave., St. Louis 20, Mo. Lincoln Lubrovans for on-the-job service are available in four complete standard groups of three, four, five, and six 400-pound drum pumps with reels. In addition, special groups may be ordered and assembled in any combination by selecting the component units desired. These units, the circular points out, may be used for portable or stationary applications.

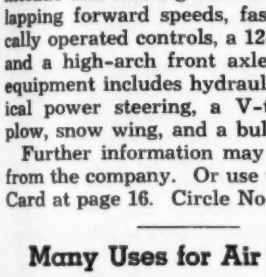
The catalog describes and illustrates all of the assemblies. Specifications are given for the connecting air hose, the delivery-hose assembly, and the drum pumps. Also included are descriptions and illustrations of hose reels and other accessories.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 208.



THE VACUUM LIFTER STACKING CONCRETE SLABS. VACUUM CONCRETE PRECASTING LOWERS CONSTRUCTION COSTS.
WRITE FOR INFORMATION AND LITERATURE.

VACUUM CONCRETE, INC. 4210 SANSOM STREET PHILADELPHIA 4, PA.



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FOR CONSTRUCTION EQUIPMENT

LINK-BELT CHAINS
on CRANES and SHOVELS

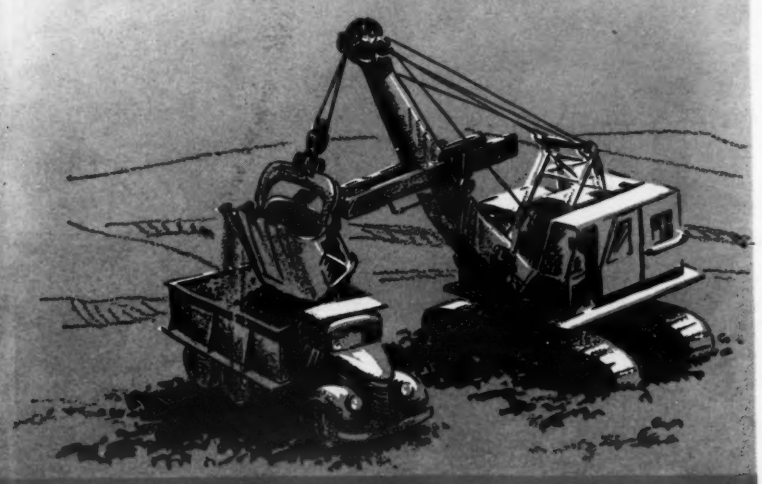
You'll frequently find three types of Link-Belt Chains on power shovels and cranes, each best suited to its purpose, and all sharing the background of Link-Belt experience and manufacturing excellence.

Link-Belt Silverstreak High Speed Silent Chain combines the rugged strength needed on all construction equipment, with the ability to transmit high power at high speeds, for long years of efficient performance.

Link-Belt Precision Steel Roller Chains are used extensively on power takeoff drives, crowd drives, crawler drives and retrac drives. These chains offer high tensile strength, ample wear value, light weight and resistance to fatigue, so much needed on shovels and other portable construction equipment.

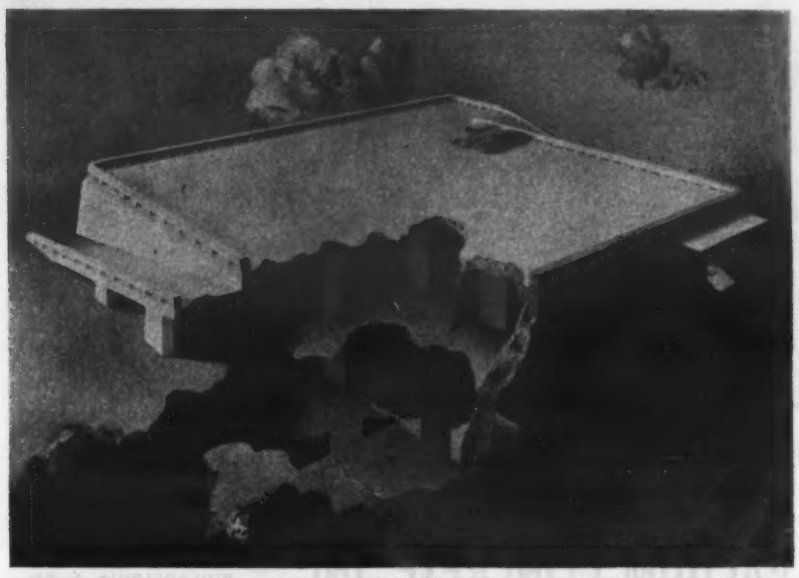
Link-Belt Class SS Steel Roller Chains are ideal for crawler drives and for crowd drives on shovels. Of selected steel, they are scientifically designed and manufactured to deliver reliable service for long periods.

Let Link-Belt experience guide your selection of chains and sprockets for power transmission and conveying purposes on construction equipment, and assure yourself of maximum results in economical performance.



LINK-BELT COMPANY 12,118
Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Johannesburg.
Offices, Factory Branch Stores and Distributors in Principal Cities.

LINK-BELT
Chains and Sprockets



Atomic Shelter Institute makes this standardized atom-bomb shelter to provide protection for 2,500 to 3,000 people at a distance of 2,000 feet from the center of an atomic blast.

Atom-Bomb Defense A Calculated Risk

The destructiveness of atomic weapons is no longer a subject of speculation—defense still is. Defense has always lagged, offense has always led. Only recently have engineers come forth with the fundamental principles for protection of life and property against the effects of the atom bomb.

Atomic Shelter Institute, Inc., 10 Park Ave., New York, N. Y., has developed a standardized shelter—one which may be varied in strength and capacity—to provide protection for 2,500 to 3,000 people at a distance of 2,000 feet from the center of an atomic blast. The President of the organization, Emanuel M. Frank, points out, however, that this is for the nominal atomic bomb: one with an energy equivalent of 20,000 tons of TNT.

It is interesting to note the three conditions which an atomic shelter must withstand for survival: blast, heat, and radiation. At the center of burst of a nominal bomb, 20 trillion calories of energy are released resulting in temperatures of over a million degrees C, pressures of several million pounds per square inch, and radiation equal to thousands of roentgens.

For obvious scientific and economic reasons, atom-bomb shelters must be designed to resist damage not at point zero, but at some reasonable distance from the center of the blast. Atomic Shelters Institute has selected a distance of 2,000 feet as a practical point. This is from the center of burst, not ground zero. Thus the shelters are designed to withstand a burst 2,000 feet directly overhead, 2,000 feet to the side, or some combination such that the straight-line distance is 2,000 feet.

To meet the destructiveness at this point, the design provides reinforced-concrete walls of bulkhead-type construction, 4 feet thick at the base and 2 feet at the top; boron-saturated water cells in the walls for absorption of neutrons; a fully protected ventilating and electrostatic dust and filtering system; and carefully designed blastproof entranceways.

The standard shelter, Design 301, consists of two stories—one above and one below ground—75 x 75 feet. Entry is made through 12 doors, each 30 inches wide and 78 inches high, designed to be closed at the instant of burst by gamma-ray detectors. Wall and roof design loads are 7,200 pounds per square foot. The ventilating system is designed to provide 37,500 cfm of filtered air through ducts which run to each of the 24 internal compartments. The combined absorption properties of the concrete wall and borax-water cells are designed to attenuate gamma and neutron radiations.

The design details of this structure, for which patents are pending, are available only to leaseholders. However, comments and requests for more detailed information are invited by the organization.

Tarpaulins Provide Winter Protection

Waterproofed and flameproofed tarpaulins designed to protect materials and equipment on the job are manufactured by Ozark Canvas Corp., 116 E. 12th St., North Little Rock, Ark. They weigh 12 ounces per square yard before treatment and come in sizes of 15 x 20 and 20 x 20 feet. Other sizes and grades are also available. They are provided with large rustproof brass grommets.

Ozark suggests application of the tarps for building-construction windbreaks, all-weather protection of materials and equipment, tents or truck covers, and enclosures for steam curing of winter-poured concrete.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 218.

Broadside on Diesel Power

A broadside on the new GM 6-110 diesel engine has been offered by the Detroit Diesel Engine Division of General Motors Corp., 13400 W. Outer Drive, Detroit 28, Mich. It includes complete engine specifications and performance charts, and points out that the Model 6-110 is designed for mobile, stationary, and marine applications. Improved performance features in the 200 to 275-hp class include reduced weight-to-horsepower ratio, 2-cycle operation, multipurpose cylinder block, precision unit injector, a new centrifugal blower, and a push-button starting system. The center fold of the broadside shows a large cutaway view of the engine with all construction clearly outlined.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 180.

HOW TO REDUCE FOR THRIFTY RE-USE...

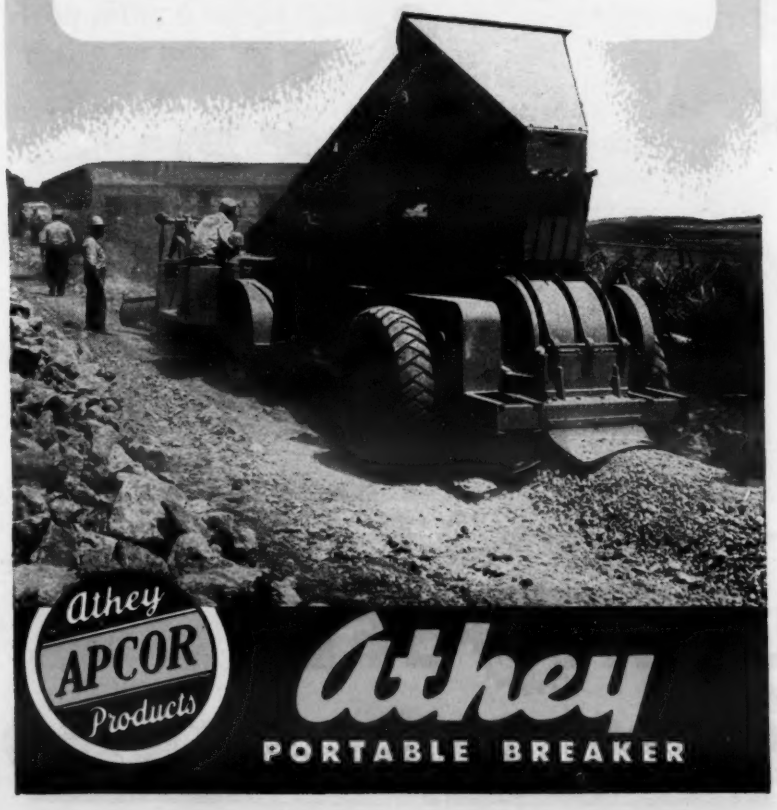
70 Tons of Broken Concrete Per Hour!

Do as the picture shows! On an Illinois job, using on-the-spot, direct-from-windrow reduction of broken concrete, an Athey Portable Breaker produces in 1 hour 70 Tons of resurfacing material — *that is there!* Right on the Job!

The logical, engineered teaming of the Athey Force-Feed Loader with the "Cat" Diesel-Powered Athey Portable Breaker maintains a balance of pick-up with crushing capacity. Positive loading and uniform crushing of anything from Black Top to Concrete (under one-man control) enable this matched unit to handle a wide job-range!

Figure Athey Portable-Breaker performance in your next resurfacing job. Compare the Athey method with other methods. Your Athey-"Caterpillar" Dealer will tell why you should buy "Athey"!

ATHEY PRODUCTS CORPORATION, Chicago 38, Illinois



POWERED BY CUSTOMERS' TRACTOR-MOUNTED WINCH.

IN ONLY 5 "QUICK" MINUTES IT'S DETACHED, LOADED AND RE-ATTACHED

Ready to GO! AND

ROGERS POWER LIFT DETACHABLE GOOSENECK TRAILER

PATENTS PENDING

Frame is lowered to ground without need of blocking. Maximum height of 16" assures rapid, safe loading of equipment.

Complete Literature available upon request—Any Rogers Dealer will demonstrate its features right on your desk, with an OPERATING SCALE MODEL.

RAISES ITS DECK TO CLEAR HIGH BANKED CROSSINGS
STOOPS TO CLEAR LOW OVERHEAD OBSTRUCTIONS
CARRIES HEAVIER LOADS MORE PROFITABLY ON LARGER TIRES

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Distributor Doings

AED Meets Next Month

Registrations for the 32nd Annual Meeting of the Associated Equipment Distributors, January 28 to February 1, at the Stevens Hotel, Chicago, are expected to approach last year's record-breaking total of 1,700. "Scarcities, Taxes, War—Where Do We Go From Here?" will be the theme of the meeting.

According to Convention Committee Chairman F. J. Fitzpatrick of Parker-Danner Co., Hyde Park, Mass., the 1951 program will feature several distributor forums and a joint distributor-manufacturer panel, the latter to be the closing session of the four-day program. The traditional Early Birds' Breakfast will be in honor of President C. F. Halladay, Halladay-Dettman Co., Sioux Falls, S. Dak. The President's Reception will be held on January 29 and the Annual Banquet on January 30. Both the opening luncheon on January 29 and the closing luncheon on February 1 will be addressed by outstanding speakers. New officers and regional directors for 1951 will be inaugurated at the Installation Luncheon on January 31.

Other convention committee members are S. F. Laskey, Northwestern Equipment Co., Fargo, N. Dak.; H. J. Hush, Griffin Equipment Corp., New York City; W. W. Kershaw, The Robison-Kershaw Co., Salt Lake City, Utah; and S. J. Oechsle, Metalweld, Inc., Philadelphia.

Fall Meeting of Region 11, AED

Region 11 of the Associated Equipment Distributors—Arizona, California, Nevada, and Hawaii—held its fall meeting on October 26 and 27 at the Biltmore Hotel in Santa Barbara, Calif. There were television, magic, dinner-dancing, golfing, bridge, canasta—and business.

With Regional Director Beal Shaw presiding, the business part got under way Thursday, October 26, right after lunch. John M. Server, Jr., Editor of *Southwest Builder and Contractor*, briefed conferees on the 1951 national budget for construction work in the west and pointed out that it is several million dollars greater than in 1950.

Frank A. Nikirk, Professor of Civil Engineering at the University of California, on a leave of absence from the Milton-Hale Machinery Co., Inc., of Albany, N. Y., told about the course he has set up at the university to train engineering students for contractors' organizations. The new course is called "Engineering Construction". It is designed to acquaint students with the basic principles underlying construction practices, the selection of methods, and the operation and performance of plant and equipment. Its subject matter deals with principles rather than facts and techniques, and Mr. Nikirk attempts to condition the student for the climb from technician to professional recognition by stressing the relationship between various functions in a construction operation and between the various components of the construction industry.

W. H. Barber, Vice President of the San Diego Chapter of the Associated General Contractors, spoke on the construction industry's role in the world today, and Winfield H. Arata, Manager of the Northern California Chapter of

(*Continued on next page*)

At the fall meeting of Region 11, Henry M. Hale, at left, Milton-Hale Machinery Corp.; Speaker Frank A. Nikirk, Professor of Civil Engineering at the University of California; and Beal Shaw, Director of Region 11, Shaw Sales & Service Co.

THE "Quinn Standard" FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

Quinn Heavy Duty Pipe Forms

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request. Also manufacturers

QUINN CONCRETE PIPE MACHINES

QUINN WIRE & IRON WORKS 1645-12 St BOONE IA

For Efficient Production

ON SMALL AS WELL AS LARGE JOBS . . .

H & B Model PA Portable Asphalt Plants

MOTO-PAVER

Complete mixing and paving machine for travel mix work. Write for Bulletin MP-49.

These PA plants are designed to give efficient production on small as well as large jobs—under a wide variety of operating conditions.

PA plants may be driven with individual motors or from one main power unit for the tower and one for the dryer, using gasoline, Diesel, Diesel electric or electric power. They are easily portable by truck. Low overall height is maintained by using a flat screen, and can be further reduced by use of a depressed driveway. Write for Bulletin P-46.

H & B builds portable and stationary mixing plants of all types, sizes and capacities.

HETHERINGTON & BERNER INC.
731 Kentucky Ave. Indianapolis 7, Ind.

FOR BEST RESULTS — HOT MIX — BATCH MIX

Distributor Doings

(Continued from preceding page)

the AGC, appraised trade organizations.

Jack How, Manager of the Edward R. Bacon Co. of Hawaii, gave an address on business methods in sales and service as they affect the AED and the AGC. Henry Hale, President of the Milton-Hale Machinery Co., talked on "National AED Activities". A. F. Garlinghouse of Garlinghouse Bros., Los Angeles, spoke on Washington news. And Robert Heuer, Chief Deputy Administrator of Los Angeles County Civilian Defense, described the planning of civilian defense in California.

The second meeting on October 27 featured a panel discussion on inventories, priorities, allocations, rebuilding construction machinery, manpower, rental rates and rental purchase, credit, collections, financing, and dealers' participation in sales made by manufacturers direct to government. Participating were Charles H. Grant of C. H. Grant Co., Berkeley; C. E. Skidmore of Industrial Equipment Co., Los Angeles; B. J. Koetters of M. P. McCaffrey, Inc., Los Angeles; C. H. Jeffries of Garlinghouse Bros.; Clinton D. Price of Peterson Tractor & Equipment Co., San Leandro; and H. J. Mayer of Western Machinery Co., San Francisco.

News of Hyster Distributors

French Mill Supply Corp., of Utica, N. Y., is now selling and servicing Hyster trucks in 16 counties of central New York State. With the acquisition of this new line, French Mill is setting up a separate division to specialize in plant material-handling problems.

Speer & Co., of Mt. Healthy, Cincinnati, Ohio, is the other new dealer recently appointed by Hyster Co., to sell and service its handling equipment in southwestern Ohio, eastern Indiana, and northern Kentucky. A. Burns Speer and Charles W. Mayer, both formerly with Equipco Sales Co., Hyster's truck dealer in Pittsburgh, are in charge.

Another Hyster dealer, Richmond Auto Parts of Richmond, Va., has opened a branch sales office under the name of Virginia Bearings & Supply Co., 354 Salem Ave., S. W., Roanoke, Va. H. D. Zimmerman is Branch Manager.

News Notes From Herd

We've been briefing ourselves on news of Herd Equipment Co., Oklahoma City equipment distributor, by reading recent issues of its monthly publication called "Scene and Herd Along the Road". We've learned among other things that Herd has taken on three new accounts of late: Heltzel Steel & Iron Form Co., Chain Belt Co., and Case Tractor Co. It has started work on a new annex building to increase its floor space by about 6,000 square feet. It has set up a Contractor and Industrial Sales Division headed by G. L. "Granny" Teague. John McNeill and Leo Hennigan have recently joined this new sales division.

Smith Leads LeTourneau Dealers

Smith, Inc., Fargo, N. Dak., heavy-equipment distributor, leads all domestic and foreign distributors for R. G. LeTourneau, Inc., in 1950 dollar volume, and on a cumulative basis leads all distributors in several additional classifications. It has sold the most big machines, the most small units, the most snowplows, and the most Tournapulls equipped with dozers.

Knowing that some billion dollars will go into dam-building projects in North Dakota and vicinity, distributor Smith, Inc., of Fargo, sponsored a Business Opportunity Conference for contractors and engineers. Here President Don Smith, left, and Vice President and Treasurer R. H. Barry, right, flank manufacturer R. G. LeTourneau during the conference, beside a map of North Dakota.

Officials of Smith, Inc., explain the company's prowess in the distributor field by referring to its large wholesale and retail clearing house for used equipment and to the public-relations policy which prompted the company to sponsor a Business Opportunity Conference last spring. The conference, which was intended to encourage North Dakota contractors to try for dam-building contracts in North Dakota and adjoining states, was attended by Government engineers, bankers, contractors, and equipment manufacturers.

Cummins Opens in Toledo

Cummins Diesel Service & Sales of Michigan, Inc., 3810 Gratiot Ave., Detroit, has opened a branch at 225 W. Alexis Road, Toledo, Ohio. The new shop has 3,010 feet of floor space, five truck bays, and equipment for complete engine overhaul and rebuilding. The parts department is fully stocked, and road service is available from this new location 24 hours a day in northern Ohio and southern Michigan.

Gumout Sales-Service Team

Three service men of the Pennsylvania Refining Co., Cleveland, Ohio, are now working with dealers to help

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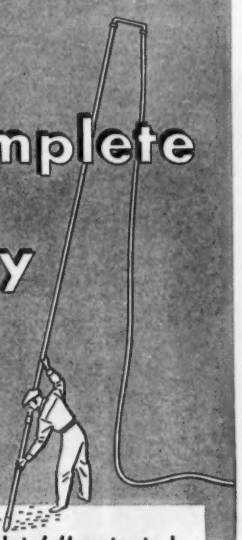
dewater the Complete way



THE COMPLETE WELLPOINT IS SELF JETTING

"Complete's" patented wellpoints give you compactness, simplicity, lightness and Strength. Keep wet work bone dry when other methods fail. Write or wire for estimates, and engineering consultation.

Don't Gamble with costly water hazards . . . get "COMPLETE" and get *results!*

Write today for "Complete" catalog Dept. CEM

COMPLETE MACHINERY & EQUIPMENT COMPANY, INC.
36-40 11th STREET
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Branch Warehouse
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COMPLETE WELLPOINT SYSTEMS

FOR SALE OR RENT

Better Lighting For Your Work With This Rugged STURDILITE

HEAVY-DUTY FLOOD LAMP

BUILT TO TAKE IT — Specially designed for extra efficient, long-lasting service on —

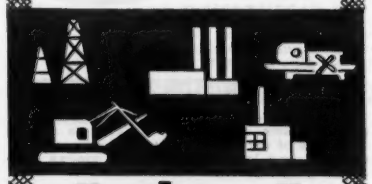
SHOVELS-EXCAVATORS-DRAGLINES-ROAD BUILDING EQUIPMENT - LOCOMOTIVE CRANES - TRACTORS

Extra high light intensity and spread from sealed-beam unit. Entire assembly mounted on rubber cushioned base to absorb vibration and shocks. Fully proved by years of trouble-free service. Available in 6-8; 12-16; 24-28; and 110-120 voltages.

ILLUSTRATED BULLETIN, detailed specifications, and prices sent upon request.

PHOENIX PRODUCTS CO. *Metal Spinning Div.*
4727 N. 27th Street Milwaukee 16, Wis.

Do costly thrust bearing replacements help to send your production costs sky high?
When "SABECO" replacement split thrust washers are used, dismantling of machines or equipment is not necessary — *simply slip these patented washers over the shaft* and lock with a safety key.
On the spot repair for:
Heavy construction machinery, plant machinery, materials moving equipment, oil field equipment, power houses, pumping stations and other large installations.
Made of tried and proven "SABECO" Bronze . . . assuring maximum life and top performance.
In any practicable size . . . to your specification.
Write Dept. CE for complete information and engineering assistance.



"sabeco"
SAGINAW BEARING CO.
821 S. WATER STREET
SAGINAW, MICHIGAN

Distributor Doings

(Continued from preceding page)

introduce Gumout carburetor detergent to the trade. John F. Balzer, Gail H. Heyduk, and Robert J. Collingswood are the members of this first team. When the group has tested all angles of the new program, the company expects to expand its station-wagon fleet of field service representatives.

Two Firms Add Cleco Line

The Ensminger Co. now handles Cleco pneumatic tools in the Wilkes-Barre, Pa., territory. It maintains a complete stock of parts and accessories.

In the St. Cloud, Minn., and surrounding area, Granite Tool Co. is now the Cleco distributor.

Supplier Is Happy Customer

Somehow we seldom think of a dealer as an ultimate consumer, but the Van der Vaart Brick & Building Supply Co., Sheboygan, Wis., has a Hydrocrane it swears by. Its principal use is handling concrete sewer pipe, transferring it from freight cars to trucks. With a three-man crew, the truck-mounted hydraulic crane does in an hour and a half what five men used to do in three hours. The Bucyrus-Erie model also comes in handy, says Van der Vaart, for moving wire mesh and for charging truck mixers with gravel when regular facilities are overtaxed.

Whitehead Joins Boardman

Bill Whitehead has joined the staff of The Boardman Co., Oklahoma City, Okla. He will represent the company in the sale and service of construction machinery, especially trenching equipment, for the pipeline trade.

Prior to this appointment Mr. Whitehead was Southwestern Sales Representative for Buckeye.

Branch for Andrews Equipment

R. B. Andrews, who is now operating Andrews Equipment Service in Spokane, Wash., is opening a contractor-machinery business, Andrews & Andrews Equipment, at the foot of Gibbs Street just south of the Ross Island Bridge in Portland, Oreg.

Branch Head for Gibson-Stewart

Vern L. Wheeler is now General Manager of the Columbus, Ohio, plant of The Gibson-Stewart Co., Cleveland equipment distributor, and Vice President of the company. For the last five years he has been District Manager for Euclid Road Machinery Co., and from 1935 to 1941 he owned and operated an equipment distributorship in Columbus.

Gibson-Stewart distributes a complete line of construction machinery. Its major account is the LeTourneau line of Tournapulls and Tournadozers.

To Head New Branch for Whayne

The Roy C. Whayne Supply Co. of Louisville, Ky., is erecting a new branch office in Ashland, Ky. Edwin Randle will take charge there as soon as the building is completed. He is now Sales Engineer in the Louisville area.

The company has other branch offices in Paducah, Ky., and Evansville, Ind. It is exclusive dealer in Kentucky and southern Indiana for Caterpillar Tractor Co., Thew Shovel Co., Gardner-Denver Co., Jaeger Machine Co., Pio-

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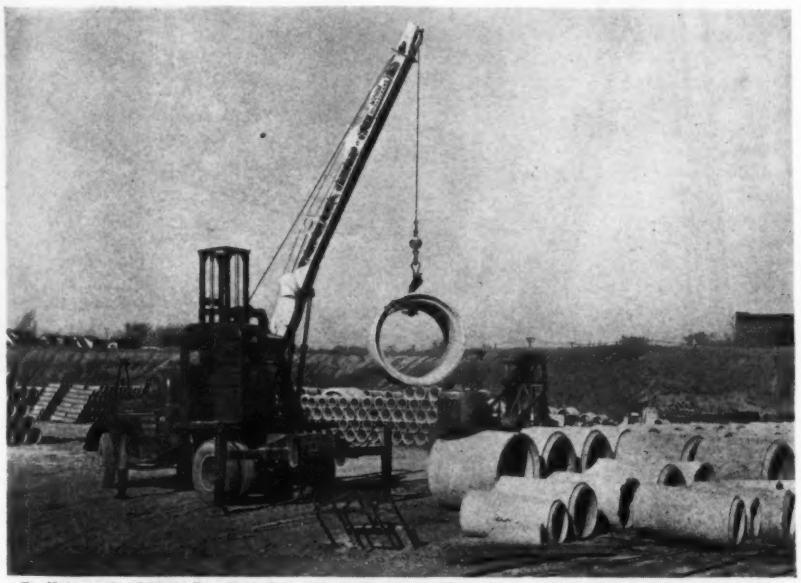


In the yard of Van der Vaart Brick & Building Supply Co., Sheboygan, Wis., a Hydrocrane handles concrete sewer pipe.

STA-VIS STARTING FLUID

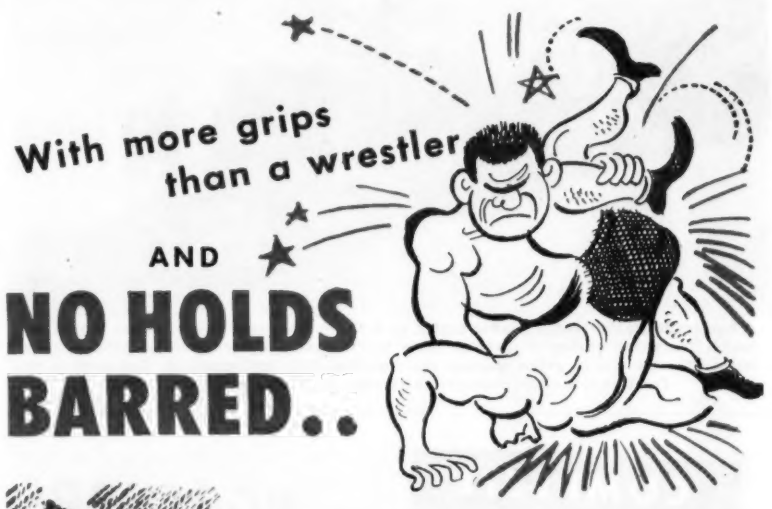
AUXILIARY FUEL FOR QUICK STARTING OF DIESEL ENGINES

- Prolongs battery life
- Sure fire starts
- Saves time and money
- Economical—price reduced

LARGE 24-OUNCE CAN ONLY $1.20 25-can case shipped prepaid

Distributor Territories Open—Write for information

STA-VIS OIL COMPANY. St. Paul 2, Minn.



NO HOLDS BARRED..

A wrestler with exclusive right to use unbreakable holds would win every bout.

A similar advantage, responsible for its unequalled performance, is a feature of the Owen Grapple.

Its ingenious Patented principle of operation enables each tine, or prong, to dig in and grip independently of the other tines.

As a result the Owen Grapple gathers and grasps several rocks of varying size or holds in its unbreakable grip stone of tremendous sizes and fantastic shapes that could not possibly be handled by grapples of conventional design.

Get the Owen Grapple bulletin which proves these strong statements with many varied and interesting photos.

Owen Buckets and Grapples

A MOUTHFUL AT EVERY BITE

THE OWEN BUCKET CO.

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Branches

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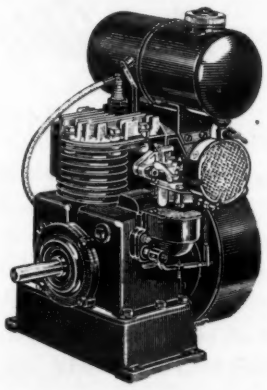

Model K7-1, 1½ H.P. 4-cycle, single cylinder, air-cooled. Length 13", width 14", height 17", Weight 38 lbs.

POWER FOR:

Concrete Mixers
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Road Oilers
Conveyors
Compressors
Pumps
Elevators
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And other uses.

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Compact • Quick-Starting Reliable

Kohler Engines are designed, engineered and built to give the same dependable, economical service that has won world-wide acceptance for Kohler Electric Plants in construction and other industries. Made in several sizes, they are suited to a wide range of uses. Kohler engineers will gladly assist in working out applications for your particular requirements. Write for information. Kohler Co., Kohler, Wisconsin. Established 1873.

KOHLER OF KOHLER

PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS • AIR-COOLED ENGINES

Distributor Doings

(*Continued from preceding page*)

neer Engineering Works, J. I. Case Co., and other manufacturers.

Spots Green Markets for Dealers

There is a nice green market for road-building equipment in the fields on the other side of the fence, Northfield Iron Co. has reminded its dealers in a recent bulletin. That market is the soil-conservation movement which is rapidly gaining momentum.

Northfield's bulletin tells dealers about the Southern Minnesota Soil Conservation Day demonstration that was put on at a farm near Janesville, Minn., last September. Over 8,000 people, potential prospects, turned out to watch pasture improvement, land contouring, terracing, waterway grassing, etc. Northfield's Husky motor graders —a 22 and a 33 hydraulic—performed on the bench terracing and ditching.

Contour farming and terracing, the bulletin explains, causes water to "walk downhill" and soak into the soil on its way, instead of running down and carrying away with it valuable topsoil. It adds from 5 to 15 per cent to the average production of a farm, and soon more than pays for itself.

If any of these farm demonstrations come up in your area, Northfield suggests to its dealers, why not enter a Husky on the terracing, using a 40-hp wheel-type tractor to pull it?

Joins Contractors Supply Corp.

Daniel J. Rosenberg, formerly of Acrow, Inc., and for many years associated with the Dodge Reports Division of the F. W. Dodge Corp., has joined the sales force of Contractors Supply Corp., Long Island City, N. Y. He will specialize in the sale of Whiteman Power Buggies, finishing, and rodding machines, along with a general line of heavy hardware, tools and equipment.

Dealers for Salamanders Sought

Stillwell Supply Corp., exclusive distributor in New York and New Jersey for the Scheu Hy-Lo oil-burning salamander, has had its territory extended to include all of the New England states. It is now looking for dealer outlets in New England.

The company's address is 44-68 Vernon Blvd., Long Island City 1, N. Y.

Branch Opened by Evans

The J. D. Evans Equipment Co. of Rapid City, S. Dak., has opened a branch office at 500 South Cliff Avenue in Sioux Falls, S. Dak.

A hydraulic Husky motor grader pulled by a 40-hp Sheppard diesel tractor works out on bench terracing during a district farm conservation demonstration near Janesville, Minn. There's a nice green market for road-building equipment in this sort of work, the Husky's manufacturer, Northfield Iron Co., reminds its dealers.

WIN THE BATTLES OF THE SNOW
through
FASTER•SAFER•CLEANER
SNOW REMOVAL
with
DAVENPORT-FRINK
SNO-PLOWS

V-Blade Sno-Plows for all sizes and makes of motor trucks—also tractors, motor patrols and locomotives.

Straight Blade or Reversible Blade Sno-Plows are desirable for lighter snows or for cleaning one side of street or highway at a time.

DAVENPORT BESLER CORPORATION
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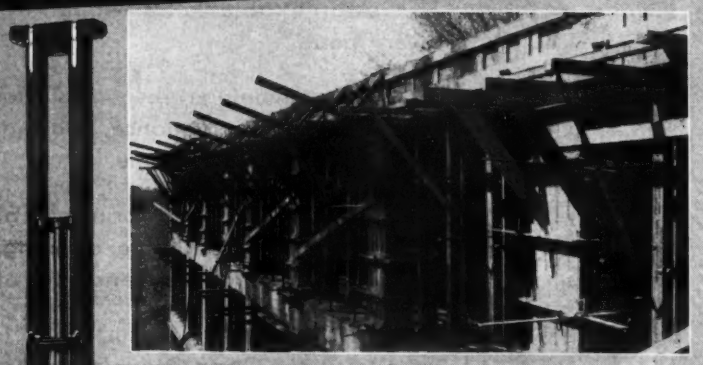
Made in Eastern U.S.A. by CARL H. FRINK, 1000 Islands, CLAYTON, NEW YORK

COMPLETE SAFETY... WITH ROOSHORS



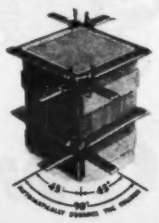
The GREATER the LOAD the GREATER the GRIP

Rooshors are absolutely safe . . . at all times the *pressure is three times as great as is necessary to prevent slipping.*

Rooshors fit every job and are easily handled by one man. They are instantly adjustable within their three ranges of sizes: 8 ft. to 14 ft., 7 ft. to 13 ft., and 5 ft. to 9 ft.—higher stories are shored with Roos Extension Shores.

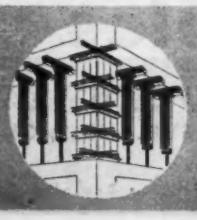
ROOS COLUMN CLAMPS SAVE TIME AND MONEY

Columns are *quickly* formed with the Roos Clamp because it is impossible to put them on wrong and there are no loose parts to become lost . . . a hammer is the only tool needed to tighten.



Rooshors and Roos Column Clamps are available for rental from warehouse stocks in principal cities from coast to coast—for prompt service.

Write today for Bulletin 352



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"Standard of Quality" FOR STEADY, LOW-COST SERVICE ON EVERY PILE DRIVING JOB...

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From 80 years of hose-making experience, Goodall has built into "INFERNO" the high factor of safety and the qualities insuring extra long service life that make this hose so desirable and economical for all pile driving operations and every other heavy duty steam service. The tube offers remarkable resistance to hardening and cracking under high temperatures. Tightly braided galvanized steel wires reinforce the rugged, heat-resistant carcass. The tough red cover withstands severest abrasive wear and all conditions of weather. Long-lasting flexibility is another feature of "INFERNO'S" powerful construction.

Recommended for pressures up to 200 lbs. and temperatures to 400°F. Stocked in all sizes from ½" to 2" I.D., in maximum lengths of 50 feet.

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GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
Branches: Philadelphia · New York · Boston · Pittsburgh · Chicago · Detroit · St. Paul · Los Angeles
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Est. 1870

This new portable electric bench grinder is the Hi-Power Model 400. The grinding wheels are 4 inches in diameter and ½ inch in thickness.

New Bench Grinder

A new compact portable bench grinder has been announced by Portable Electric Tools, Inc., 320 W. 83rd St., Chicago 20, Ill. Known as the Model 400 Hi-Power bench grinder, the new unit incorporates a fan-cooled 110-120-volt single-phase 60-cycle 3,500-rpm motor with a precision, dynamically balanced rotor; two fully adjustable tool rests; an on-off toggle switch built into the front of the motor housing; a streamlined, lightweight, die-cast motor housing with integrally cast wheel guards; and a base with no-creep rubber feet.

The grinder is finished in baked-on Hammerloid enamel and is supplied as standard with two balanced, vitrified grinding wheels with a 4-inch diameter x ½-inch face (one fine and one coarse) and a 6-foot rubber-covered cord and plug. It is available also as a package with adapter and drill chuck, buffing wheels, sanding disks, polishing bonnet, and wire wheel brush.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 143.

Portable Gravel Plant Described in New Bulletin

A complete portable gravel-crushing, screening, and loading plant with three stages of crushing and two screening operations is described in a new broadside prepared by Universal Engineering Corp., Division of Pettibone Mulliken Corp., 620 C. Ave. N. W., Cedar Rapids, Iowa. The Universal 293QS TwinDual Gravel King features a scalping screen which by-passes pit-run material of finish size directly to a delivery conveyor. Material not requiring primary crushing by-passes the jaw crusher and is routed directly to the roll crushers.

A cutaway view illustrates the stream flow of the material and indicates product combinations available with this unit. The literature gives complete specifications on both the junior plant and the senior plant. The capacities for these are, respectively, 100 to 150 and 150 to 225 tons per hour of one-inch stone with a 50 per cent crush.

This literature may be obtained from the company by requesting Bulletin No. U501, or by using the Request Card at page 16. Circle No. 146.

Paving-Materials Manual

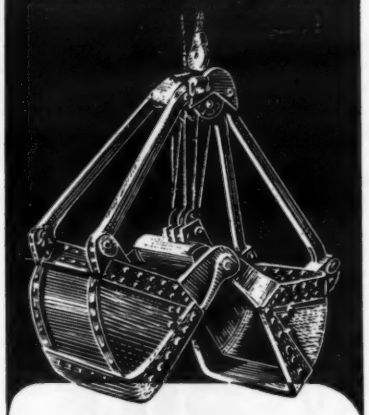
A new 46-page paving-materials manual has been prepared by The Barrett Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. The first portion describes the operations and pavement types in which Tarvia road tar and Tarvia-Lithic bituminous concrete are used. The methods of construction are described in general terms, since local conditions may require modifications.

The second portion tells how Barrett paving materials may be utilized in the repair and maintenance of different pavements. All sections of the brochure are fully illustrated with on-the-job photographs. Tabulations of Tarvia road tar, Tarvia-Lithic bituminous concrete, and aggregate sizes and uses have been included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 227.

AVOID NEEDLESS WASTE!

IN THESE TIMES, IT'S ESSENTIAL TO SALVAGE YOUR WORN EQUIPMENT



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SAVES TIME AND MONEY . . . Clamshell Buckets, repaired with MANGANAL, often outlast new ones!

MANGANAL is easily bent, hot or cold . . . work-hardens under impact and abrasion to 550 Brinell . . . tensile strength up to 150,000 p.s.i.

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Speed Nut

SNATCH BLOCK

A simple whirl of the SPEED NUT . . . BLOCK FALLS OPEN . . . no bolts to unscrew and lose.

Insert the line with the greatest of ease while block is suspended.

Push the plate into place . . . twirl the SPEED NUT and you have it!

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THE CLEVELAND TRENCHER CO.

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Job-Integrated Safety Will Pay Its Own Way

Safety Must Be Part of the Work and Originate at the Top, Is Consensus at Safety Congress in Chicago

✦ HOW to make safety a part of every construction operation was the theme of the Construction Section meetings at the 38th National Safety Congress in Chicago, October 16-20. A record-breaking attendance of approximately 300 marked the two sessions devoted to accident prevention in construction.

Integrating Safety With Work

Top management is charged with the responsibility of operating a business efficiently. This means that it must analyze all elements of cost. A small amount of research shows that accidents cost money—more money than the cost of a well run safety program. So Granville M. Read, Chief Engineer of E. I. du Pont de Nemours & Co., told the delegates.

Large or abnormal losses in men and money indicate lack of sound organization, as well as lack of understanding of the problem, Mr. Read pointed out. When top management takes the time to evaluate the benefits of a safety program, places the right men in the work, and spends enough money to carry out the program, then and only then will safety programs yield satisfactory results, he said.

Mr. Read called attention to the almost universal habit of handling safety as something separate and apart from the regular function of the project. But, he pointed out, safety is not something separate to be handled by somebody in an isolated department called the Safety Department. Safety at all levels of organization must be integrated with the work.

This integrating must originate at the top, and move downward; not from the bottom up, Mr. Read stated. He then gave some suggestions for safety integration at the top management level, as fellows:

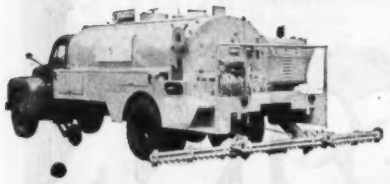
1. Provide a simple, practical, enforceable safety clause in contracts and subcontracts.
2. Include with the contract a letter on safety policies to be followed by the contractors.
3. Carefully screen and assign a capable safety engineer to the project as soon as construction starts.
4. Provide brief practical printed instructions from owner to contractor's field supervision at the new work site at the start of the work.
5. Design safety into new production facilities. Train design engineers to think safety.
6. Provide for the public welfare and public safety around job sites.
7. Insist on performance - rating analysis from the insurance company for insurance cost reduction as soon as you merit it.
8. Allow in the job estimate ½ to 1 per cent of labor dollars for a safety program. This will save both the contractor and owner money.
9. Make provision through company policy for review, inspection, and re-

(*Continued on next page*)

How can safety be integrated with job operations?—a panel discussion during the Construction Section meetings at the National Safety Congress. Left to right are R. J. Hendershott, Manager of the Minneapolis Chapter of the AGC; panel leader R. C. Reber, Field Project Manager for duPont; Col. W. D. Brunig, Safety Director of the D. W. Winkelman Co.; and H. B. Alexander, President of H. B. Alexander & Son.

LITTLEFORD

"Spray Master"



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When it comes to spraying Bituminous Materials on Roads, Streets, Highways or Runways, there's no unit that can operate at a lower cost than the Littleford "Spray Master" Pressure Distributor. This unit with either a Standard or a Full Vacuum Flow Circulating Bar up to 24 ft. in width can lay material on the Highway with 100% efficiency.

Then too, there are no gadgets to take a lot of the operator's time turning them off and on; with a "Spray Master"— one valve starts and stops the spray. "Spray Masters" are made in models up to 4000 gallons in size. Make your next Distributor the master of them all, the "Spray Master."

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LITTLEFORD BROS. INC.
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1 of 10 Reasons Why UNIT is a Better Machine

UNIT 614—½ Yd. 25 years of engineering skill and craftsmanship have gone into the production of this outstanding model. It offers the same rugged construction usually found only in machines of greater capacity. Compare its construction, features and design with any ½ yard machine in the market today. Get the facts—Write today for literature.

The one-piece cast gear case is an exclusive UNIT feature. It provides a completely rigid enclosure for all gears, shafts, and bearings. All shaft openings are simultaneously bored by a machine designed specifically for this accurate operation. Misalignment is impossible. Every working part in this self-lubricating, main machinery case operates in a constant bath of oil. Flawlessly sealed at every point, it keeps lubricants in — dirt and abrasives out! Split drums and sprockets are mounted on large diameter shafts with short spans between bearings. This reduces deflection to a minimum, and bearing replacement is seldom necessary. It's a precision-made masterpiece of design and engineering — "The Heart of Every UNIT!"

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Crawler and Mobile models — ½ and ¾ Yd. Excavators. Cranes up to 20 tons capacity.

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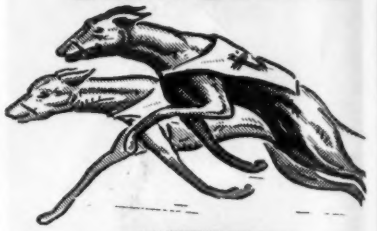

In PILE DRIVING

It's SUPER-VULCAN OPEN TYPE DIFFERENTIAL-ACTING PILE HAMMERS 18C, 30C, 50C and 80C

Super-Vulcan drives 'em down fast with double the number of smashing blows per minute, more penetration of each pile per blow, a saving of one-fourth to one-third the steam. Positive action on all types of piles.

Marked economy comes through the Super-Vulcan's fast action, through simple design, rugged strength, and durability for minimum maintenance costs. The open type fits the same leads and uses the same accessories as the Warrington - Vulcan Single Acting Pile Hammer. Write for complete details.

Sizes 18C—30C—50C—80C meet all needs

VULCAN IRON WORKS Since 1852
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Chicago 12 ---Illinois

Harry J. Kirk, new General Chairman of the Construction Section, NSC, (left) receives the badge of office from J. L. De Luca, retiring Chairman.

ports of progress and results by top management at regular monthly intervals.

10. Clarify, in the light of safety, policy provisions by management covering pre-employment physical examinations, welfare plans, and similar indications of management's sincerity and desire to accomplish a humanitarian goal.

For the field performance level, here are his suggestions:

1. Employ a safety engineer, safety supervisor, or inspector full time or part time as the job requires.

2. A job-safety planning committee should meet once each week and distribute in writing to all foremen, one week in advance of the work performance, specific advice on the anticipated hazards.

3. Provide safety orientation talks for all new employees, at employment, and do it with firmness.

4. The policies to be followed by the contract engineer and his inspection department should be well defined.

5. Require daily Safety Task Assignments by all supervision and foremen. This means safety instruction for every job or task *by* the foreman *at the site* of the specific task *to the man* or men who perform the task.

6. Discuss and control safety as part of all work and not something apart from the work.

7. Require weekly housekeeping inspections of all areas, monthly inspections of all equipment, and the provision of time and material to shore up, barricade, handrail, and plan the placement of all materials and equipment for safe environmental conditions. These must be controlled from day to day on a practical basis. They must be paid for, and must be done with the knowledge and belief that they can be done profitably.

8. The execution of any and every block of work should be planned specifically with safety in mind. For example, if part of the general project is the construction of a pumping station or a powerhouse, then the plans for the erection or construction of each stack should be considered a "block" of work to be planned with safe operation as a major object of the planning.

9. Planning must be carried down to the gang foremen's level so that even small chores like opening flanges of pipelines that carry acids or corrosives are also planned. Accidents happen at task performance level; therefore, to prescribe planning for tasks is not outside the realm of practicality.

In closing, Mr. Read pointed out that although safety has made great progress in past years and on a broad front, there are still new horizons to be pushed back. He concluded: "Safety is humanitarian. It follows the laws of God and man. Safety can be applied on a profitable basis. Safety works from the top down and not from the bottom up. Safety should be integrated into the work for maximum effectiveness. Safety is everybody's business every day, but only through hard work will its performance be worth while."

How to Integrate Safety

Carrying on the general theme of the meeting, a panel discussion followed Mr. Read's address, in which some of the ways in which safety is integrated with construction operations were outlined. Leader of the panel was R. C. Reber, Field Project Manager for du Pont at Charleston, W. Va. Mr. Reber holds a world safety record, having supervised over 21,000,000 work-hours with an accident frequency of 2.04 and, on one project, more than 4,000,000 work-hours without any accident at all. On the panel were R. J. Hendershott, Manager of the Minneapolis Chapter of the Associated General Contractors; Col. W. D. Brunig, Safety Director of the D. W. Winkelman Co., Syracuse, N. Y.; and H. B. Alexander, President of H. B. Alexander & Son, contractor of Harrisburg, Pa.

The discussion brought out that the action needed to integrate safety at the top includes a competent (with emphasis on "competent") aggressive safety organization which can and will earn field respect and therefore field support; inclusion in contracts or subcontracts of a clause requiring adequate practical accident-prevention methods, followed up by enforcement; more consideration of safety at the design stage; follow-up on insurance rates; and regular reports to top management on safety, costs, and progress.

Moving down to field level, it was agreed, there must be a planned program for safe and efficient work, involving the whole working force. Rules must be practical, workable—and enforced. Employee training must include safety orientation. There must be real safety inspection. Pre-employment

(Continued on next page)

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SELF-HEATING ASPHALT SMOOTHING IRON

Contractors! This lightweight, rugged, simple, time and money saving smoothing iron will pay for itself in a few days use.

No more building and tending fires on your asphalt jobs!

HOT IN TEN MINUTES
HOT ALL DAY LONG

• RUGGED • ECONOMICAL
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Short Story for CONTRACTORS

NAYLOR PIPE
is ideal for construction jobs because it's LIGHT in Weight... yet HEAVY on Performance

Sizes from 4 to 30 inches in diameter and thicknesses from 14 to 7 gauge. All types of connections, fittings and fabrications. Write for complete details.

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GET BETTER RESULTS WITH GLEDHILL PLOWS

(rear view of tapered plow)

Rear view of tapered plow shows safety trip, foldback hoist, interchangeability—all standard features. Gledhill plows are made this way because they're better this way.

Send for complete specifications!

A LOOK BEHIND TELLS YOU THERE'S SATISFACTION AHEAD

This "operator's eye view" of the V-plow shows why he has confidence in the job it will do—year after year. Note heavy-duty construction—crimped moldboard sections which aerate the snow. You have a choice among 22 models to meet your requirements.

(rear view of V-plow)

THE GLEDHILL ROAD MACHINERY CO.
GALION, OHIO

Job-Integrated Safety Will Pay Its Own Way

(Continued from preceding page)

physical exams are highly desirable, where possible. Weekly safety-committee meetings were urged, as were foremen talks and meetings. Get the men to talk and make suggestions. Group competitions and contests help to arouse interest. Make compliance easy; take the time and trouble to analyze and understand the obstructionists; they can usually be convinced. Don't forget the importance of personal contacts. Use all means and media to publicize safety.

Many of these points were explored further in the ensuing period of questions and discussion from the floor. One other was brought up—how much should be allotted to safety in a job budget. It was stated that for 1 per cent of the payroll, an efficient well organized safety program can be provided, though it is not necessary to spend even that much. On 48 projects carried out by one organization, it was reported, the most spent on any project was 1.3 per cent of the payroll; less than 1 per cent on others. The items of cost charged to safety, were (1) salaries of safety personnel, 5 per cent; (2) personal protective and auxiliary safety equipment, 15 per cent; (3) time for educational work, orientation, foremen's talks, mass meetings, 80 per cent.

Who's Responsible for Safety?

G. W. Maxon, President of the Maxon Construction Co. of Dayton, Ohio, was scheduled as the feature speaker at the second session, to discuss the problem of fixing the responsibility for safety on the job. Mr. Maxon, who is now Vice President and was recently nominated for next President of the Associated General Contractors, was unable to be present. Harry J. Kirk, Safety Director of the AGC, presented Mr. Maxon's paper for him.

In it Mr. Maxon stated that safety is big business, because it is a part of construction, which is big business. As in any other big business, there is to be expected a certain amount of regulatory control. He said, however, that there is a current tendency to an increasing amount of regulatory control in construction, which is introducing unnecessary and unjustifiable costs.

All industrial regulation, he said, has been brought about by the failure of industry to see and meet its problems. Compensation insurance, for example, has become obligatory. As a result, contractors and insurance companies have been forced into a working partnership in construction. Through the years this has become a satisfactory and mutually beneficial arrangement.

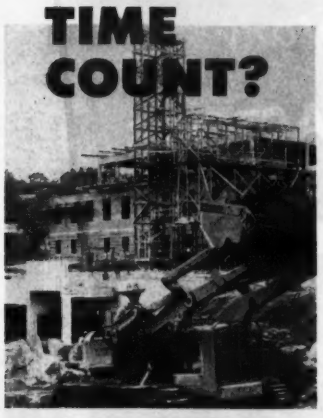
Now, he said, an effort is being made by other individuals, organizations, and agencies to promulgate safety measures. Good-intentioned as they may be, safety effort can be successful only if it becomes a part of the work. As it is, there is confusion resulting from different and often conflicting regulations and procedures. Such confusion will increase if more organizations or agencies become responsible for safety in construction. Construction management has the greatest interest in accident prevention, and safety must be administered in the field. If labor leaders, industrial commissions, and others inject themselves into the picture the results may be chaotic, and the costs disastrous.

J. A. De Luca, du Pont Safety Engineer and General Chairman of the Construction Section of the National Safety Congress, leads the discussion during a clinic on safety problems. Left to right are Otto S. Holmskog, Senior Construction Engineer, Employers Mutual; Mr. De Luca; Gunar Anderson, Superintendent for Taylor & Gaskin; and L. H. Korsman, Division Superintendent of Stone & Webster Engineering Co.

To prevent such a situation Mr. Maxon urged contractors to accept and carry out the full responsibility for

(Continued on next page)

DOES YOUR TIME COUNT?



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WILD NI
The Contractors Level

Have you the latest, time-saving machinery, and an antiquated, time-wasting Level? THEN make ALL YOUR TIME COUNT WITH THE WILD NI, THE "CONTRACTOR'S BABY."

- Split End (coincidence) Reading of Tubular Level Bubble, centering 10 times more accurate than old fashioned "Open" Level.
- 3 Leveling Screws: EASIER, FASTER to operate. Will never jam or cause stresses in the instrument.
- "Bulls Eye" Level for rough leveling.
- Available with horizontal circle for easy, accurate Laying-out of Angles.

These, plus other modern WILD refinements add up to MORE JOBS, FASTER and EASIER DONE, WITH HIGHER PRECISION.

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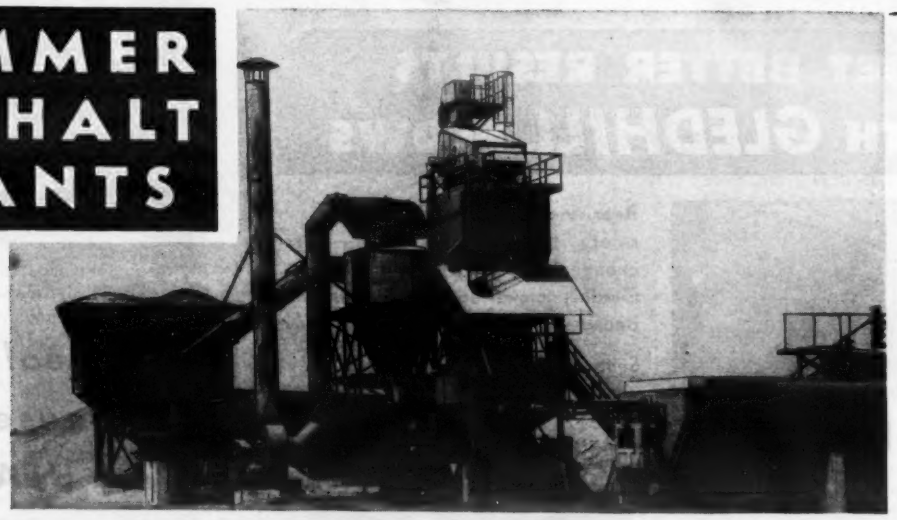

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safety on the job and to continue the present contractor-insurance company partnership in accident prevention. Let others serve as umpire, iron out difficulties, work out scoring methods, observe the results—but let the team play the game, he concluded.

Making It Work

Final and summarizing feature of the sessions was a clinic on safety problems. J. A. De Luca, Safety Engineer, E. I. du Pont de Nemours & Co., and 1950 General Chairman of the Construction Section, led the discussion. Gunar Anderson, Superintendent, Taylor & Gaskin, Detroit; L. H. Kornman, Division Superintendent, Stone & Webster Engineering Corp., Chicago; and Otto S. Holmskog, Senior Construction Engineer, Employers Mutual of Wisconsin, Wausau, Wis., made up the panel.

Questions asked included: how can one deal with the obstructionist or chronically careless worker; are insurance companies giving all the help in accident prevention which they should; what about safety legislation; what are national organizations doing to effect standardization of building codes; can't there be greater standardization of accident-prevention procedures; what can be done to interest the small contractor—the greatest violator of safety rules—in accident prevention; what about asking contractors to submit their accident-frequency rate with bids; and how can one handle the problems of craft jurisdiction when in conflict with safety?

Suggestions offered by panel members were:

1. For the obstructionist or chronically careless worker, try psychology. Try to understand him and his point of view. There is always some reason for his attitude; what is it? Once it is understood, it is usually possible to persuade him at least to try the safe way. Careful selection of men in the first place, more thought in job assignments, understanding and patience in training, and good personnel relations are all important in securing efficiency and safety on the job.

2. Perhaps some insurance companies are not giving the service they should; many are. But it is up to the contractor, as a buyer of insurance, to insist on having the service and help to which he's entitled. If a contractor feel's he's not getting his money's worth, he should look around; he *can* get it elsewhere.

3. Last June there were seven bills concerned with safety in Congress. While some legislation, particularly at local levels, is doubtless beneficial and certainly inevitable, on a national level it is likely to be dangerous and is very undesirable. Contractors can do two things: assume the responsibility and take positive steps to improve the safety record of the construction industry; and be sure that such legislation as may be necessary is brief and practical.

4. Constructive steps have been taken by the ASA to standardize building codes, and considerable progress has been made. Everyone must help to make it more effective.

5. Yes, more agreement in the interpretation of safety rules and measures is needed.

6. One way of helping the small contractor to reduce job accidents is through contractor organizations. In Detroit the building contractors held a series of meetings for foremen and supervisors at which problems of safety were discussed. In 4 years, accidents were reduced 25 to 40 per cent. Another means is through labor unions.

7. A contractor is often required to submit his most recent insurance rate, an indication of his accident record, along with his bid. In some cases, as on private work, a high rate might mean he wouldn't get the job. But on all public works, while it might be a good idea to ask for it, it can have no influence, since the contract must be awarded to the low bidder—or the lowest responsible bidder. As yet, the definition of "responsible" does not include a contractor's status as to job accidents.

8. In whose jurisdiction is this job? A really ticklish problem, and often one with direct bearing on how safely the job will be done. It can be solved only through agreement—by salesmanship, psychology, and good personnel relations.

Further amplification was requested of du Pont's Safety Task Assignment (STA) and Violation Frequency Rate (VFR) procedures referred to earlier in the meeting. STA, Mr. De Luca stated, is merely a procedure for giving, along with instructions for any job, the necessary instructions for doing it safely. This is required at all levels, from chief engineer down to

(*Concluded on next page*)

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Greater speed and ease of handling make MM Industrial Wheelers the natural choice for economy handling of construction and maintenance jobs. A complete selection of attaching or pull type equipment provides a wide range of job application.

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The "shuttle gear" for fast reversing . . . "roller steering" that makes easier handling of any load . . . enable MM Industrial Wheelers to handle more loads per hour on loading and dozing jobs with less operator fatigue. New UTIL "shuttle gear" actually gives an operator a choice of *6 forward* and *6 reverse speeds*. Speeds up to 14.5 m.p.h. save time on the job as well as road time between jobs. The "straight-line" principal used in "shuttle gear" shifting eliminates slow gear shifting, doubles the time saved and makes possible extra loads per hour.

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Job-Integrated Safety Will Pay Its Own Way

(Continued from preceding page)

gang foremen.

VFR is a simple formula providing a basis of comparison of compliance with safety rules by individuals, gangs, work areas, or jobs. It is the number of violations noted on a regular job inspection multiplied by 100 and divided by the number of men on the job that day. This can be used to stir up interest and competition between gangs, crafts, or projects, and provides a positive easily understood basis for personal or group talks to correct violations.

Chairman's Report

No. 1 accomplishment for the Construction Section for 1950 was an increase in membership ten times greater than that which resulted from previous committees' work, General Chairman De Luca stated in his annual report. Sixty-four new memberships were obtained.

Other activities of the Section for the past year included the production jointly with the Public Utilities Section of a pamphlet to educate management supervisory personnel and employees in the proper operation of equipment near electric power lines. Over 70,000 copies of the pamphlet, entitled "Three Men Killed When Crane Boom Hits Power Line", were sold.

Under the chairmanship of Robert L. Jenkins, the Engineering Committee and NSC Staff Engineer Robert L. Moore produced three illustrated safety talks for use in foremen's meetings.

Various representatives of the Section addressed a number of safety meetings and other groups throughout the country.

Mr. De Luca paid tribute to the support given to the work of the Section and to the cause of safety in construction by the national business papers serving the construction industry.

New Officers

The 1951 officers elected by the Construction Section are as follows: General Chairman, Harry J. Kirk, Safety Director, Associated General Contractos of America; Vice General Chairman, Samuel R. Bishop, Architect, New York City; Secretary, Olive E. Potter, CONTRACTORS AND ENGINEERS MONTHLY; Vice Chairman for Membership, Ray Hahn, Allegheny Asphalt & Paving Co., Pittsburgh, Pa.; Vice Chairman for Engineering, Robert L. Jenkins, Safety Director, Corps of Engineers, Department of the Army; Vice Chairman for Program, C. M. Cahill, Massman Construction Co., Kansas City, Mo.; Vice Chairman for Publicity, Harold W. Richardson, Editor, *Construction Methods and Equipment;* and Editor, News Letter, Walter J. Byrne, Consulting Engineer, New York City.

Diesel Truck Engines

A 16-page 2-color catalog describing the new Buda DA Dyna-Swirl diesel engines especially designed for all types of heavy-duty trucks has been announced by The Buda Co., Harvey, Ill. Included are detailed specifications, highlights of the various features of the new DA engines, and a full explanation of the Dyna-Swirl controlled-combustion system. The latter is said to improve the operation of the engine by providing approximately 15 per cent more horsepower and 15 per cent higher usable torque. Four pages are devoted to pictures and stories about actual installations of these engines in trucks.

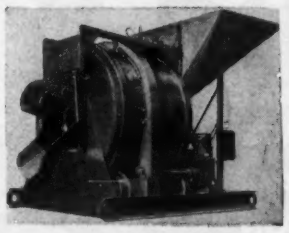
This literature may be obtained from the company by requesting Bulletin 1506, or by using the Request Card at page 16. Circle No. 177.

Chief Engineer, Worthington

Louis G. Hilkemeier is now Chief Engineer of the Construction Equipment Division of Worthington Pump & Machinery Corp. at Dunellen, N. J. He was formerly a construction machinery engineer with Chain Belt Co.

MONEY-MAKING

MIXERS



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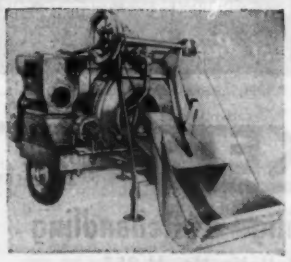

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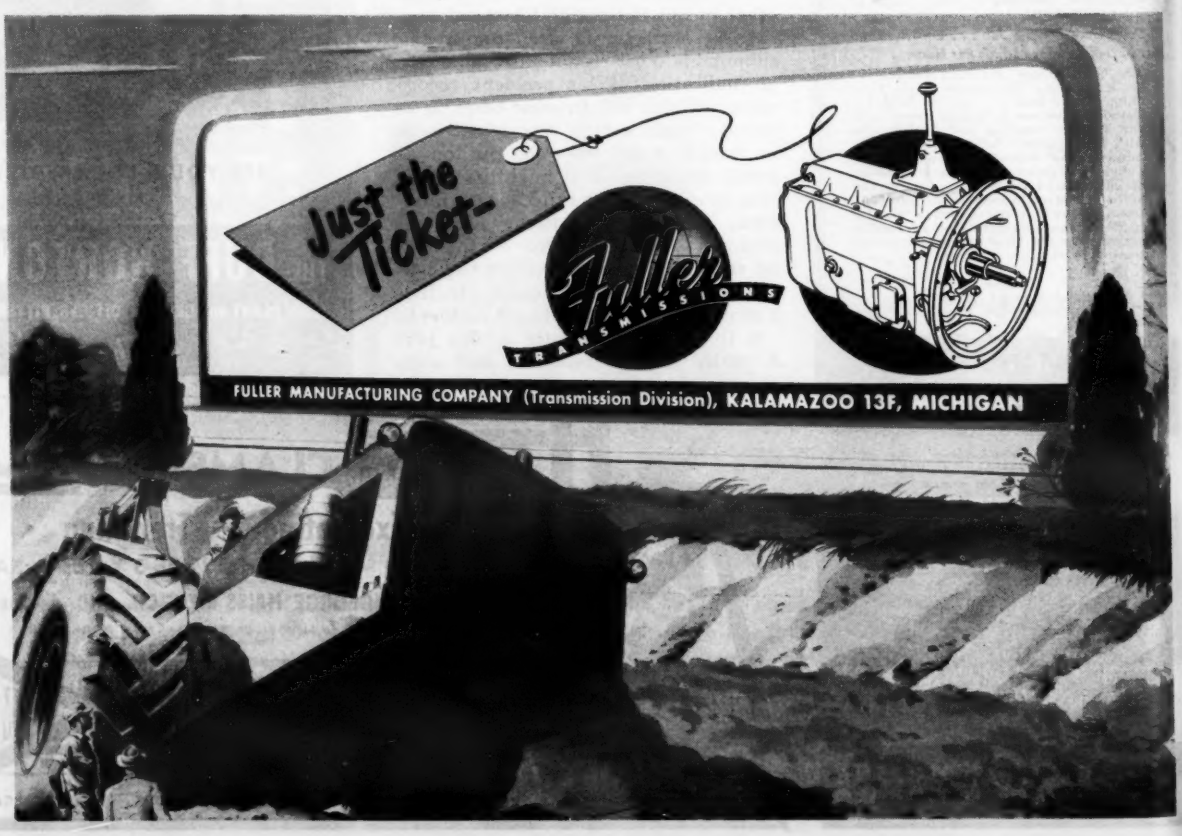

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO 13F, MICHIGAN

Building-Method Licensees Get Together in San Antonio

The first of a series of meetings for licensees of the Youtz-Slick Lift Slab building method was held recently in San Antonio by the Institute of Inventive Research, which developed the method. During the 2-day conference, the licensees pooled their experience with the method, which consists of pouring roof and upper-story slabs on a base slab and lifting them into place with automatic lifting equipment. The method had been used successfully on six structures as of last October.

The present licensees are Texstar Corp. of San Antonio, licensed as a lifting contractor; James Stewart & Co. of New York, Dallas, and Chicago, licensed to use the method in its own operations and to act as a lifting contractor for others; Long Construction Co. of Kansas City, Mo., licensed on the same basis; and Frank R. Lount & Co. of Winnipeg, Manitoba, also licensed on a similar basis. All licensees are required to report technical advances in their experience with the method; these advances are incorporated in reports to all concerned.

A Catalog of Equipment For Blacktop Road Work

A 36-page fully illustrated catalog on almost everything required for blacktop road work—from asphalt rakes to bituminous distributors—has been offered by Littleford Bros., Inc., 457 E. Pearl St., Cincinnati 2, Ohio. The equipment described includes pressure distributors, transfer pumps, trailer distributors, steam heaters, supply tanks, vapor generators, ocean sprayers, spray tanks, engine and traction-driven brooms, water sprinklers, surface heaters, heating kettles, tool heaters, a variety of rollers, salamanders, portable tool boxes, and a number of paving tools, pouring pots, sandals, and even thermometers.

All this equipment is illustrated and described in some detail. In many cases the description also notes a specific bulletin about that piece of equipment. Catalog AA is designed as a reference handbook for the blacktop-equipment purchaser.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 171.

Industrial Compressors

A new bulletin describing the T Series of stationary air compressors has been prepared by Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. This series consists of two lines, one designed for normal industrial pressures of 100-125 pounds; the other rated at 200 pounds for continuous service, and up to 250 pounds on intermittent pump-up service. Both lines are available as tank-mounted, base-plate-mounted, or bare units, with electric-motor or gasoline-engine drive. The units are air-cooled by means of fan blades integrally cast on the flywheel.

Standard equipment on tank-mounted and base-plate-mounted units includes a centrifugal unloader, intake filter and muffler, and automatic start-and-stop control. Constant-speed and dual-control are optional equipment. The bulletin shows various sizes and models and gives cross-sectional views, engineering data, sizes, and dimensions.

This literature may be obtained from the company by requesting Form 1048, or by using the Request Card at page 16. Circle No. 113.

Turnpike Dedicated

The new 100-mile Philadelphia Extension of the Pennsylvania Turnpike was dedicated and officially previewed in a day-long ceremony last October. A 100-car caravan carrying officials and their invited guests began the tour at the eastern terminus of the new highway, stopping on the trip west at each of the extension's nine interchanges for brief ceremonies. At the Valley Forge Interchange, for example, after a preliminary flag raising and invocation, Governor James H. Duff cut a blue-and-gold ribbon stretched across the Turnpike approach. Commissioner James F. Torrance, Walter H. Steel of Drexel & Co. (Philadelphia), State Secretary of Highways Ray F. Smock, and Chief Highway Department Engineer Edward Schmidt were among the officials who spoke at the ceremonies.

Ellis Is V.P. for Gramm

Dan S. Ellis has left the Lima-Hamilton Corp., of which he was President and a director, to serve Gramm Trailer Corp. as Executive Vice President.

Gramm also announces that its general offices, now at Delphos, Ohio, will be moved January 1, 1951, to the First Lima Bldg., Lima, Ohio.

Flat-Top Carbide Bit

The manufacturer of crown carbide Rok-Bits announces the addition to its line of a tungsten-carbide bit of the conventional flat-top type. Rock Bit Sales & Service Co., 2514 E. Cumberland St., Philadelphia 25, Pa., recommends this bit where limited budgets are involved. Its addition enables the company to offer a range of bit types for practically any application.

Further information on these Rok-Bits may be secured from the company. Or use the Request Card at page 16. Circle No. 109.

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SIMPLEX
Drop Forged Steel
TRENCH BRACES

For sure protection against cave-ins, injuries and costly re-digging, specify Simplex Trench Braces. Constructed entirely of steel drop forgings, with ball and socket joints, at each end to ensure quick adjustment and tight grip at all angles. Adaptable to any width trench. Sold with or without pipe in a complete range of sizes.

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Only Ellicott offers: **65 years of experience** in dredge building; **a complete line** in all sizes; **undivided responsibility**—your dredge is designed, built and delivered under *one* contract.

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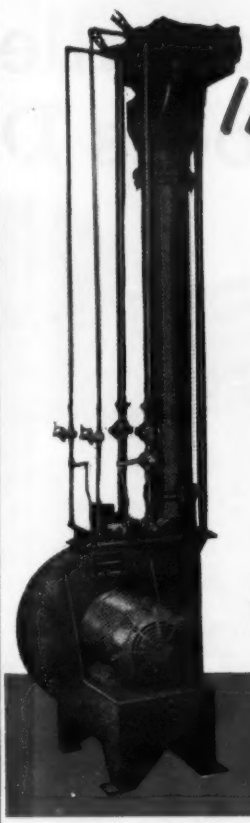

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Time after time contractors have found that Hopkins' burners save them money, provide more efficient operation, and increase production. They are adapted to any size or design of dryer.

Hopkins provides the only "package unit" burner system for an asphalt plant. Write for literature.

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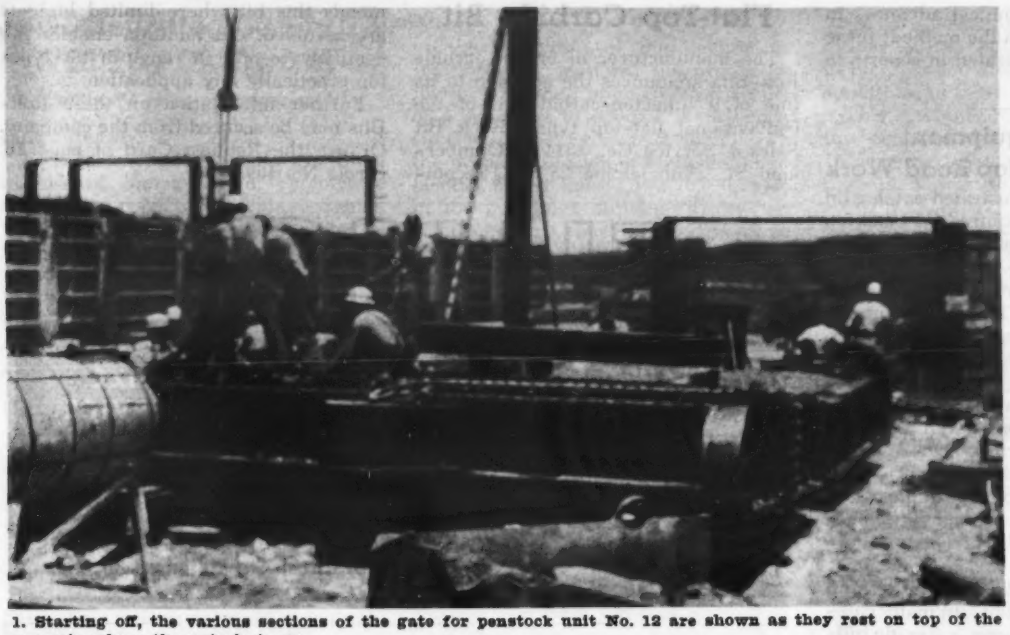


1. Starting off, the various sections of the gate for penstock unit No. 12 are shown as they rest on top of the concrete where the gate is to go.

2. Signalman George Cloven, who telephones orders to the crane operators high above him, warms up for this job as the cranes strip wooden forms away from the gate guides.

Power Gate Installed At Bull Shoals Dam

By RAYMOND P. DAY,
Western Editor

(C. & E. M. and Corps of Engineers Photos)

✦ WITH river diversion complete at Bull Shoals Dam, and more than 82 per cent of the massive concrete blocks already in place, contractors are completing the installation of three penstock intake gates. Later on, when the powerhouse now started is finished, these gates will turn White River water into the turbines.

How Ozark Dam Constructors set these 50-ton gates with cranes of far less effective working capacity is shown in the accompanying picture series.

The dam, near Mountain Home in Arkansas, is being built under general supervision of the Little Rock District of the Corps of Engineers.

Ozark Dam Constructors is a joint-venture firm. Brown & Root, Inc., of Houston, is sponsor of the project. The other firms are Wunderlich Contracting Co., Jefferson City, Mo.; Peter Kiewit Sons Co., Omaha; Winston Bros. Co., Minneapolis; David G. Gordon, Denver; Condon-Cunningham Co., Omaha; Morrison-Knudsen Co., Inc., Boise; J. C. Maguire, Los Angeles; and Charles H. Tompkins Co., Washington, D. C.

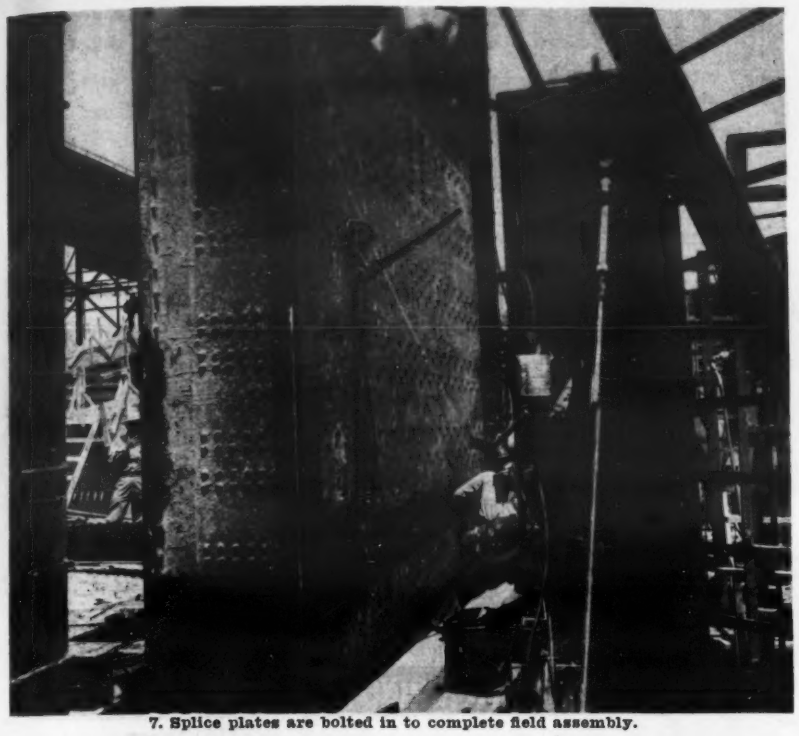
See C. & E. M., May, 1950, page 69, and April, 1950, page 24, for other articles on Bull Shoals Dam.

3. Rigger Superintendent B. T. Clark, in the background of this picture, watches initial preparation stages as his men assemble part of the heavy roller chain on top of the gate leaf.

4. The slot in which the 50-ton gate will go gives an installation clearance of only ¼ inch. A workman cleans the metal guide so no dirt or concrete can interfere with gate installation.

5. As the 20-ton bottom half of the gate is set down, it rests temporarily on these steel H-beams bolted to the concrete. It was necessary to set the bottom half this far down to get headroom clearance later on.

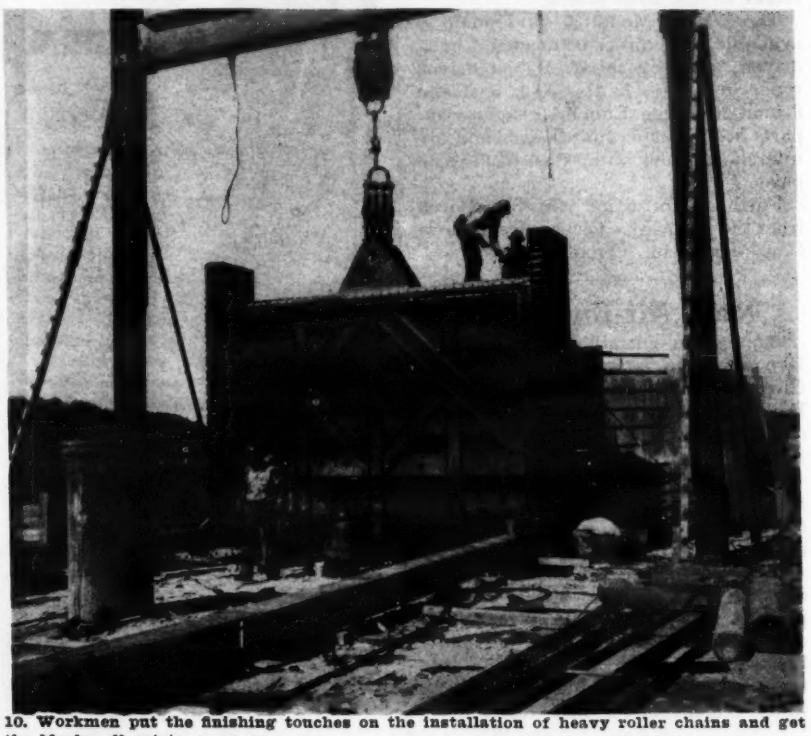
6. The top 20-ton gate section comes to rest on the bottom half previously set. Two cranes on a gantry frame high above had to double up on the 20-ton lifts. A steel template built to actual gate size was used to check the gate opening clearance.



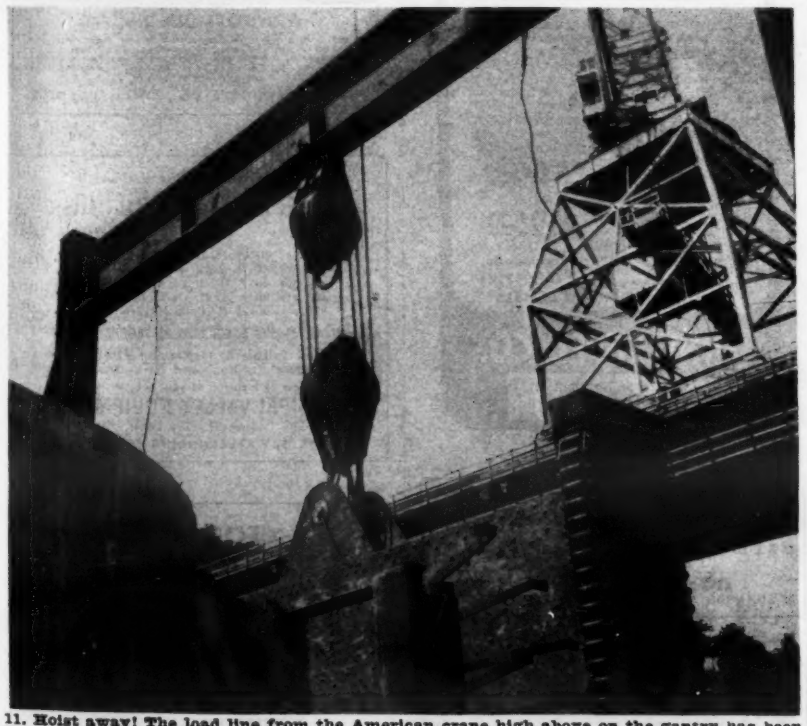
7. Splice plates are bolted in to complete field assembly.

8. The 10-ton roller chain is being installed.

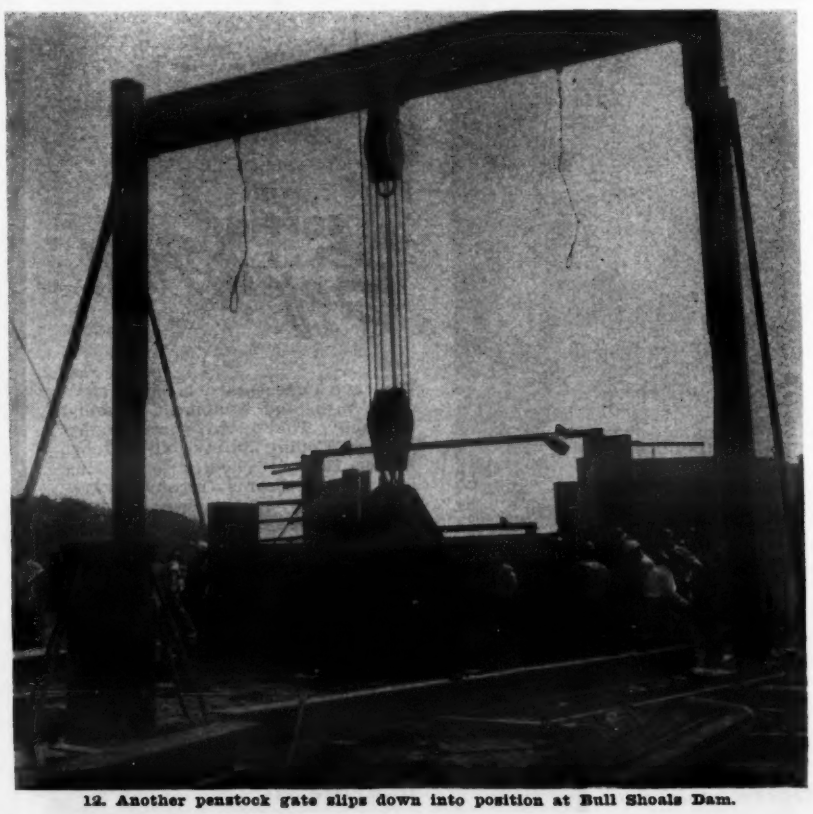
9. Now comes time to set the 36-inch 300-pound H-beam across the top of the lowering pedestals. That's a 7-way American block hanging from the center.



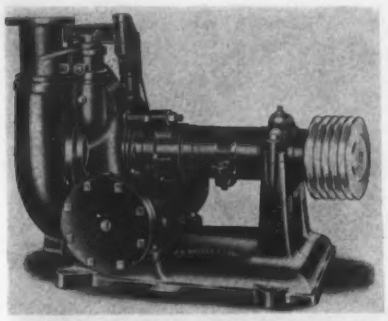
10. Workmen put the finishing touches on the installation of heavy roller chains and get the blocks all set to reeve up.



11. Hoist away! The load line from the American crane high above on the gantry has been reeved through the 7-part blocks, and the big crane easily picks up the 50-ton load because the multiple blocks simply transfer the load from the H-beam to the gantry trestle with only a 7½-ton lift by the crane. As the crane picks up its load and cables snap tight, the temporary H-beams which supported the loads are slipped out.



12. Another penstock gate slips down into position at Bull Shoals Dam.



Two-piece frame construction permits the rubber-lined or special-alloy intake chamber of the Wilfley Model K sand pump to be replaced easily.

Heavy-Duty Sand Pump

The new Model K heavy-duty centrifugal sand pump is designed for high efficiency and trouble-free operation, according to its manufacturer, A. R. Wilfley & Sons, Inc., Denver, Colo. Two-piece frame construction permits the rubber-lined or special-alloy intake chamber to be easily replaced; an improved patented check valve eliminates leakage and features long life and easy removal, the company says. Wear parts may be removed without disturbing the intake or discharge piping.

The Wilfley Model K sand pump is available in direct-connected, belt-driven, and overhead V-belt-driven types in 1, 1½, 2, 2½, 3, 4, 5, 6 and 8-inch discharge. Rubber-covered wear parts are available for all sizes and are interchangeable with the hard iron parts.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 104.

New Air-Entrainer

A new air-entraining agent called D-p has been introduced by Atlantic Chemicals, Inc., Michigan Ave. and Railroad, Orlando, Fla. This product contains Ceramid to provide a smooth hard finish to the concrete and a high water resistance. The agent is also said to reduce segregation and bleeding, improve workability, and offer a slower cure.

The manufacturer recommends the addition of D-p at the rate of 1 ounce per bag of cement for all purposes except mixing of concrete for finishing. For this the company recommends adding 2 ounces per bag. Reduction of the water-cement ratio by approximately ¾ gallon per sack of cement will provide the same slump where D-p is used. This liquid air-entraining agent is available in 55-gallon drums.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 117.

Officers for Steel Men

The following officers and new directors were elected by the American Institute of Steel Construction at its Annual Convention in Houston on October 26:

President: R. D. Wood, Mississippi Valley Structural Steel Co., Chicago. First Vice President: J. E. Jackson, Pittsburgh-Des Moines Steel Co., Pittsburgh. Second Vice President: J. Philip Murphy, Judson Pacific-Murphy Corp., Emeryville, Calif. Executive Vice President: L. Abbett Post, New York City. Treasurer: James M. Straub, Fort Pitt Bridge Works, Pittsburgh. Secretary: M. Harvey Smedley, New York City.

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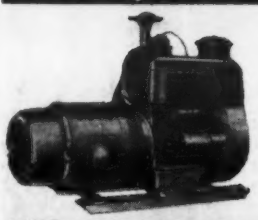

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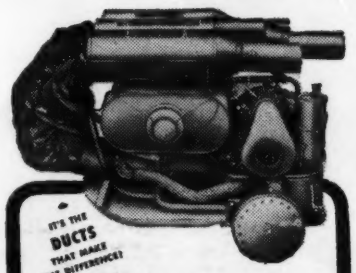

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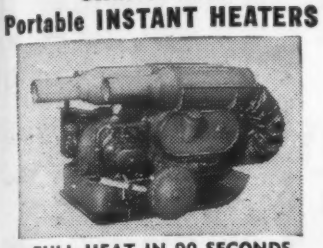

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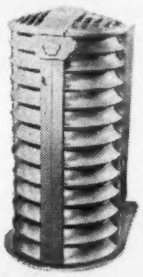

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INDEX TO ADVERTISERS

Adams Mfg. Co., J. D. 11
Aeroil Products Co., Inc. 38
Alabama Pipe Co. 56
Allis-Chalmers Tractor Div. 46, 47
American Manganese Steel Div. 29
American Steel Scraper Co. 53
Arrow Tools, Inc. 40
Athey Products Corp. 76
Austin-Western Co. 35
Automatic Steel Products, Inc. 69

Baker-Roos, Inc. 80
Barrett Division 48
Bethlehem Steel Co. 37, 69
Bicknell Mfg. Co. 45
Borden & Riley Paper Co., Inc. 90
Bucyrus-Erie Co. 57

Caterpillar Tractor Co. 8, 9
Century Geophysical Corp. 40
Chevrolet Motor Div. 36
Chicago Decalcomania Co. 65
Chicago Pneumatic Tool Co. 49
Chrysler Corp., Industrial Engine Div. 71
Cleco Division of the Reed Roller Bit Co. 29
Cleveland Trencher Co. 81
Coffing Hoist Co. 90
Complete Machinery & Equipment Co., Inc. 78
Concrete Transport Mixer Co., Inc. 44
Construction Machinery Companies 86
Cooper Co., John 70
Cummer & Sons Co., F. D. 84
Cusenbary Sales Co. 30

Dart Mfg. & Sales Co. 84
Davenport Besler Corp. 80
Dempster Brothers, Inc. 56
Dewey & Almy Chemical Co. 28
Diamond Chain Co., Inc. 27
Dienstfrey, Norbert 29
Disston & Sons, Henry 26
Dixie Tallyho, Inc. 6
Dixon Valve & Coupling Co. 70
Douglas Fir Plywood Association 66, 67
Downs Crane & Hoist Co. 15
Drake-Williams-Mount 52
Duff-Norton Mfg. Co. 85

Economy Forms Corp. 49
Electric Tamper & Equipment Co. 24
Electroline Co. 14
Ellicott Machine Corp. 87
Embury Mfg. Co. 34
Euclid Road Machinery Co. 10

Federal Machine & Welder Co. 52
Flink Co. 86
Foote Co., Inc. 61
Fuller Mfg. Co. 86

Galion Iron Works & Mfg. Co. 70
Gar-Bro Mfg. Co. 26
Garrison Mfg. Co. 25
General Tire & Rubber Co. 43
Gledhill Road Machinery Co. 83
Goodall Rubber Co., Inc. 80
Goodyear Tire & Rubber Co. 5
Griffin Wellpoint Corp. 27
Gulf Oil Corp. 32
Gurley, W. & L. E. 65

Haiss Mfg. Co., Inc., George 85
Harnischfeger Corp. 41
Hayward Co. 16
Hendrix Mfg. Co., Inc. 45
Hetherington & Berner Inc. 77
Hopkins' Volcanic Specialties, Inc. 87
Huber Mfg. Co. 54
Hyatt Bearing Div., GMC 63

International Harvester Co., Industrial Power Div. 58, 59
Iowa Mfg. Co. 72, 73

Jaeger Machine Co. 74
Joy Mfg. Co. 39

Kato Engineering Co. 61
Kay-Brunner Steel Products, Inc. 24
Kim Hotstart Mfg. Co. 14
Koehring Co. 50, 51
Kohler Co. 79

Laclede Steel Co. 64
Lansing Co. 30
LaPlant-Choate Mfg. Co., Inc. 17
Leschen & Sons Rope Co., A. 55
LeTourneau, Inc., R. G. 92
Link-Belt Co. 75
Littleford Bros. Inc. 82
Lubriplate Div., Fiske Bros. Refining Co. 87
Lull Mfg. Co. 33

Maginniss Power Tool Co. 57
McCaffrey-Ruddock Tagline Corp. 34
McKiernan-Terry Corp. 34
McKissick Products Corp. 81
Minneapolis-Moline 85
Miracle Decal Co. 91
Monarch Road Machinery Co. 25
Motor Kool Products Co., Inc. 90

National Sales, Inc. 39
Naylor Pipe Co. 83
Norgahn Co. 7
Norma Pencil Corp. 60
Northfield Iron Co. 60

Oliver Corp. 38
Owen Bucket Co. 79
Ozark Canvas Corp. 63

Partrick Co., A. 75
Pettibone Mulliken Corp. 85
Phoenix Products Co. 78
Punch-Lok Co. 48

Quinn Wire & Iron Works 77

Republic Steel Corp. 30
Rice Pump & Machine Co. 55
Richmond Screw Anchor Co., Inc. 68
Rockford Clutch Div. 60
Roeth Vibrator Co. 40
Rogers Brothers Corp. 76
Rogers Iron Works Co. 36
Rosco Mfg. Co. 52
R.P.B. Corp. 35

Saginaw Bearing Co. 78
Sasgen Derrick Co. 33
Sinclair Refining Co. 18, 19
Smith & Co., Gordon 28
Southwest Welding & Mfg. Co. 7
Speco, Inc. 54
Sta-Vis Oil Co. 79
Stulz-Sickles Co. 81
Superior Concrete Accessories Inc. 25
Symons Clamp & Mfg. Co. 32

Templeton, Kenly & Co. 87
Texas Company 3, 12, 13
Thew Shovel Co. 16
Transport Trailers, Inc. 62

Unit Crane & Shovel Corp. 82
United States Rubber Co. 53
United Steel Fabricators, Inc. 44
Universal Atlas Cement Co. 15

Vacuum Concrete, Inc. 75
Van Dorn Electric Tool Co. 37
Vibro-Plus Products, Inc. 44
Vulcan Iron Works 82
Vulcan Tool Mfg. Co. 74

Watson-Stillman Co. 31
Waukesha Motor Co. 74
Wellman Engineering Co. 31
Wenzel Tent & Duck Co., H. 22, 23
White Mfg. Co. 28
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp. 62
Wild Surveying Instrument Supply Co. of America, Inc., Henry 84
Winpower Mfg. Co. 90
Wisconsin Motor Corp. 64
Woods Mfg. Co., J. E. 83
Wyeth-Scott Co. 27

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